Desert Tortoise Monitoring in the Jawbone-Butterbredt ACEC
Bureau of Land Management, Ridgecrest Field Office

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In 2001, a Desert Monitoring Team was hired by the Bureau of Land Management (BLM) to monitor the effects of Off-Highway Vehicles (OHV's) on the desert ecosystem. One of their tasks was to complete a survey for desert tortoises (*Gopherus agassizii*) in the Jawbone-Butterbredt Area of Critical Environmental Concern (ACEC). This survey was begun in the summer of 2002 (from June to October) and continued in the summer of 2003 (from July to September). To date, 35% of the survey has been completed.

This document is divided into the following sections:

Part I: Protocol to survey the Jawbone-Butterbredt ACEC for desert tortoise

Principal Investigator (PI): Dr. Kristin H. Berry
Advisor: Dr. James Weigand
Team Leader: Kevin Keith
Survey Team: Shirley-Ann Asselta, Heath McAllister, Morgan Ruelle

Task Title: Survey hectare plots in Jawbone-Butterbredt Area of Critical Environmental Concern (ACEC) in Kern County, California, for live desert tortoises, desert tortoise sign and shell-skeletal remains; and evaluate habitat type, habitat condition, and level of human-related impacts.

BACKGROUND

In 1989 and 1990, respectively, the State of California and U. S. Fish and Wildlife Service listed the desert tortoise (*Gopherus agassizii*) as a threatened species. The U.S. Geological Survey, Biological Resources Division, and Bureau of Land Management (BLM) are cooperating on a project to establish a long-term desert tortoise monitoring program in selected desert areas used by off-highway vehicles.

OBJECTIVES

The multiple objectives for desert tortoise surveys in the Jawbone-Butterbredt ACEC are:

1. To gather baseline data on the distribution and population attributes of live tortoises and shell-skeletal remains.
2. To gather baseline data on the health and diseases of live and dead tortoises (e.g., presence of clinical signs of upper respiratory tract disease, herpes virus, shell diseases, etc.).
3. To salvage ill, dying, and recently dead tortoises according to established protocols under Dr. Kristin H. Berry's Federal scientific research permit.
4. To evaluate habitat in each plot for qualities critical to the desert tortoise.
5. To evaluate each plot quantitatively for human-related impacts and disturbances.
6. To prepare databases to keep record of live tortoises, tortoise sign, shell-skeletal remains, and human impacts.

PROTOCOLS FOR TASKS

Task 1: Surveying Hectare Plots for Live Tortoise, Signs of Tortoise, Tortoise Remains, Predator Sign Concentrations, and Human-Related Disturbances

Selecting Plots for Survey

- The entire Jawbone-Butterbredt ACEC is divided into 500 x 500 m "**quadrats**". Each quadrat is assigned a 6-digit alpha-numeric code to indicate the relevant 7.5-minute USGS topographic map for that quadrat and the position of the quadrat on that map.
- All quadrats within the ACEC are considered for surveying, and quadrats are excluded from surveys only if:
    - More than 50% of the quadrat is within 500 meters of a paved road, aqueduct pipeline, utility transmission line, or accompanying utility access road.

- Less than 50% of the quadrat is managed by BLM or cooperating agencies.
- Less than 50% of the quadrat falls within the Jawbone-Butterbredt ACEC.
- More than 50% of the quadrat lies within a designated "open area" (Jawbone Canyon Open Area or Dove Springs Open Area)
- The average elevation of the quadrat is greater than 1500 m above sea level.

- Remaining quadrats are grouped into a number of "**regions**":
  - "Indian Wells" lies between State Highway 14 and the Los Angeles Aqueduct access roads, south of Highway 178 and north of Route SC192 (BLM).
  - "Kiavah Apron" lies west of the Los Angeles Aqueduct access roads, east of the Sierra crest, south of Highway 178 and north of Horse Canyon.
  - "Blackbrush" lies east of the Sierra crest, south of Horse Canyon, north of Dove Springs Open Area and the "checkerboard" region of the ACEC.
  - "South Dove Springs" lies south of Dove Springs, east of the "checkerboard" region of the ACEC, and north of the Red Rock Canyon watershed.
  - "Red Rock" lies within the Red Rock Canyon watershed as defined by USGS, including portions of Red Rock Canyon State Park.
- Each quadrat is divided into twenty-five one-hectare (100 x 100 m) "**plots**". Random numbers are generated at www.random.org to select one plot per quadrat to survey. Plots are excluded from surveying only if:
  - The plot is within 500 meters of a paved road, aqueduct pipeline, utility transmission line, or accompanying utility access road.
  - Any part of the plot is not managed by BLM or cooperating agencies.
  - Any part of the plot falls outside the Jawbone-Butterbredt ACEC.
  - Any part of the plot falls within a designated "open area" (Jawbone Canyon Open Area or Dove Springs Open Area).
  - Any part of the plot is at an elevation greater than 1500 m above sea level.
  - The maximum slope of the plot exceeds 45 degrees.
  - Upon visiting the plot, researchers decide that it is not safe to survey the plot due to rough terrain.

Survey Schedule

- The ideal time to complete coverage of the plots is spring and summer, before summer and fall rains obscure sign created earlier in the year. Field work shall begin the first week of June and continue until October.
- To avoid working in temperatures exceeding 35 degrees C, field work begins at sunrise and continues until noon, avoiding the hottest part of the day (1300 to 1500 hours).

Keeping the Journal

- Each day, one of the researchers acts as a **recorder**. The recorder takes notes on the day's activities in the Journal (Appendix A). These notes include (but are not limited to):
  - Full names of all researchers present.
  - Time and location of arrival in the field.
  - Time of arrival at each plot.
  - Time each researcher begins to search plot.
  - Time each researcher finishes searching plot.
  - Time of departure from each plot.
  - Time researchers begin to process any live tortoise, tortoise sign, tortoise remains, or predator sign concentrations.
  - Time researchers finish processing any live tortoise, tortoise sign, tortoise remains, or

predator sign concentrations.
    - Time of observations of other wildlife (jackrabbits, birds, etc.).
    - Time of departure from the field.
- With the exception of the size and the format, notes shall be written in the manner described by Hall in *The Mammals of North America.* The hand-writing must be neat and the grammar sufficient to pass a college entry exam for college Freshman English.
- All times shall be noted in Pacific Standard Time. Subtract one hour from the observed time when Daylight Savings Time is in effect.
- At 0800 and 1200 hours, the recorder shall use a mercury thermometer to measure and record the temperature at 1.5 m above the ground, 1 cm above the ground, and at the surface of the ground. The recorder shall measure these temperatures in the shade by turning away from the sun and shielding the thermometer bulb from direct light. The recorder shall also observe wind speed, wind direction, and sky cover. All weather observations shall be recorded on the first page of the Journal.
- At the end of the day, researchers summarize their work on the first page of the Journal. These notes include:
    - Names of plots surveyed that day
    - ID numbers of tortoises observed that day (sorted by capture type)
    - ID numbers of tortoise remains collected that day
    - ID numbers of cover sites observed that day
    - ID numbers of predator sign concentrations observed that day
    - Descriptions of vehicles driving by or through any plots
    - Descriptions of visitors to the plot (not related to the field work)
    - Counts of burros, cattle, or other domestic animals on plots
    - Descriptions of shooting of firearms on or near plots
    - Any other significant occurrences
- Using notes on the day's activities (from above) researchers calculate and record (on the first page of the journal) the time each researcher spent:
    - Searching plots
    - Walking between plots
    - Processing live tortoise, signs of tortoise, tortoise remains, and predator sign concentrations.

Setting Up Plots for Surveys

- The second researcher acts as **navigator**, using a GPS unit to locate the closest corner of the next plot. Upon arriving at this corner, the navigator places an eight-foot flagged pole (made of 1-inch PVC pipe sharpened at one end). The navigator proceeds to all four corners of the plot, placing flagged poles at each.

Searching Each Plot

- Each plot receives two complete coverages: one coverage by one researcher and one coverage by a second researcher. One researcher searches the plot walking due North and due South at 10 meter intervals, beginning 5 meters from a corner of the plot. The second researcher searches the plot walking due East and due West at 10 meter intervals, beginning 5 meters from a corner of the plot.
    - For example, a researcher might start searching North-South from the south-west corner of a plot. First, the researcher paces 5 m east, marking that spot on the ground, then paces another 10 m east to place a pole. The researcher returns to the spot marked on the ground and proceeds 100 m north, searching all the way. When the researcher

arrives at the northern edge of the grid, (s)he paces 10 m east, marks the ground, paces another 10 m east, and places the pole. The researcher returns to the marked spot and proceeds 100 m south, searching while heading directly at the pole already placed on the southern edge. This pattern continues until the researcher has passed over the plot 10 times and finishes the plot near the south-east corner.

- The recorder searches for live tortoise, signs of tortoise, tortoise remains, predator sign concentrations, and human-related disturbances. The recorder keeps tallies of all human-related disturbances, including signs of cattle, on the Human-Related Disturbance Sheet (Appendix B). In Jawbone-Butterbredt ACEC, the recorder shall complete a Human-Related Disturbance Sheet for each plot.
- The navigator also searches for live tortoise, signs of tortoise, tortoise remains, predator sign concentrations, and human-related disturbances EXCEPT for cattle scat ("cow patties"). The navigator shall focus on finding tortoise and tortoise sign, the primary objective of the survey.
- When either the recorder or the navigator encounters live tortoise, signs of tortoise, tortoise remains, predator sign concentrations, the recorder shall complete the appropriate data sheet(s).
    - For signs of tortoise (cover sites, scat, tracks, etc.), the recorder shall complete a Field Data Sheet for Tortoise Sign (Appendix C).
    - For live tortoise, the recorder shall complete a Field Data Sheet for Live Desert Tortoise (Appendix D) AND a Tortoise Health Assessment (Appendix E).
    - For tortoise remains, the recorder shall complete a Field Data Sheet for Shell-Skeletal Remains of Desert Tortoise (Appendix F).
    - For predator sign concentrations, the recorder shall complete a Field Data Sheet for Area of Predator Sign Concentration (Appendix G).
    - For observations of avian predators, the recorder shall complete an Avian Predator Form (Appendix H).

Assuring Equal Search Effort

- Early in each field season, the survey team shall test the consistency of field researchers. Five of the one-hectare plots shall be randomly selected for this test. Each researcher on the team shall walk the plot in the same direction (North-South or East-West), searching as he or she would search any other plot. Each researcher shall record observations of live tortoise, signs of tortoise, tortoise remains, predator sign concentrations, and human-related disturbances independently.
- When all researchers have completed all five coverages, the team leader shall compare all data sheets to determine if individuals observe and record data consistently.
- The team leader shall address major differences in observations by providing the necessary training to researchers who overlook specific signs of tortoise, tortoise remains, predator sign concentrations, or human-related disturbances.
- The team leader shall address major differences in record-keeping by discussing the standards for record-keeping with all researchers.

Task 2: Observing and Documenting Human-Related Disturbances

- Researchers shall observe and document all human-related disturbances on all plots. A Human-Related Disturbance Sheet (Appendix B) shall be completed for each plot.

Human Disturbances

- Researchers shall tally the number of all human objects found on plots, including but not limited to:
    - General garbage (cans, bottles, cardboard, etc.)

- Balloons (mylar or latex)
- Firearm casings
- Shooting targets ("clay pigeons", "skeet")

- If objects have broken (particularly bottles and shooting targets), researchers shall estimate the original number (not count the pieces) for the tally.
- Researchers shall tally the number of human tracks and trails (foot travel, motorcycle, four-wheel drive, etc.) through each plot and map their locations on the Human-Related Disturbance Sheet. Researchers shall estimate the average width of each track or trail.
- Researchers shall tally the number of areas denuded by vehicle use on each plot and map their locations on the Human-Related Disturbance Sheet. Researchers shall estimate the total surface area of each denuded area.

Grazing Disturbances

- Researchers shall tally the number of cattle trails through each plot and map their locations on the Human-Related Disturbance Sheet. Researchers shall estimate and record the average width of each trail.
- The recorder (but not the navigator) shall tally the number of cattle scat ("cow patties") on each plot. Because cow patties break into pieces over time (and yet disturbance does not increase), the recorder shall consider pieces within 2 feet of each other to be part of the same cow patty.
- Researchers shall tally any other human-related disturbances, including but not limited to all those listed on the Human-Related Disturbance Sheet.

Task 3: Observing and Documenting Tortoise Sign

Tortoise Cover Sites

- Researchers shall document all cover sites observed on and off plots on a Field Data Sheet for Tortoise Sign (Appendix C).
- Each cover site shall be assigned an ID number, beginning with CS-1 each day.
- Before disturbing the area around a cover site, researchers shall photograph the site, placing an index card in each photograph to identify the image. The index card shall include the date, the name of the quadrat, whether the cover site is on or off the plot, and the ID number for the cover site. The photograph shall clearly show the shape of the entrance to the cover site. Researchers may take a second photograph of the environment around the cover site.
- Researchers shall use a mirror and a metal probe to check all cover sites for live tortoise or tortoise remains.
- Researchers shall measure and record the height, width, and depth of each cover site. Since the width is used to estimate the size of the tortoise using the site, that measurement shall be taken at the site's narrowest point.
- Researchers shall classify the size and condition of each cover, referring to codes provided on the Field Data Sheet for Tortoise Sign.

Tortoise Scats

- Researchers shall document all scats observed on and off plots on a Field Data Sheet for Tortoise Sign.
- Researchers do not need to photograph scat.
- Researchers shall not collect scat, as experts believe tortoises use scat as navigational landmarks.
- Researchers shall measure the length and width of each scat and record these measurements on the Field Data Sheet for Tortoise Sign.

- Researchers shall classify the recency of each scat, referring to codes provided on the Field Data Sheet for Tortoise Sign.

Other Tortoise Sign

- Researchers shall document any other tortoise sign (courtship rings, drinking sites, footprints, aggressive encounter sites, and predator attacks sites).
- Researchers shall classify the recency of all sign, referring to codes provided on the Field Data Sheet for Tortoise Sign.
- Researchers may take digital photographs of all other sign.

Task 4: Processing a Live Tortoise

Preventing the Spread of Tortoise Diseases

- Special precautions are taken to prevent the spread of upper respiratory tract disease (URTD), herpes virus, other contagious diseases, and parasites (including ticks). Some tortoise populations within the Mojave and Colorado deserts are currently free of the infectious URTD and herpes virus, and some are not. These measures shall reduce opportunities for spread of disease between tortoises in the Jawbone-Butterbredt ACEC and elsewhere.
    - Each tortoise shall be handled with a fresh pair of disposable gloves. Immediately after use, each pair of disposable gloves is placed in a plastic trash bag.
    - Each item of equipment touching the tortoise (including poles used to probe tortoise and other animal burrows) shall be sterilized with a dilute solution of bleach. All equipment is sterilized before it is placed in its carrying case and before it is used to process another tortoise.
    - Precautions shall be taken to assure that tortoises do not come in contact with the legs or trousers of researchers after another tortoise has contacted the same area. Each field researcher shall use fresh pieces of paper or plastic sheeting to cover his or her legs while processing a tortoise. The paper or plastic sheeting shall be placed in the plastic trash bag after use.
    - Field researchers shall not travel from the Jawbone-Butterbredt ACEC to another area in the geographic range of the desert tortoise before bathing and changing clothes and shoes. The Federal government requires that the field researchers wear a different set of clothes (including shoes or boots) for each region, or researchers must wash clothes and rinse shoes in a sterilizing solution before traveling from one region to another.
- If research veterinarians and U. S. Fish and Wildlife Service personnel recommend additional protective measures, the government shall provide the measures to the survey team and shall require implementation.
- As of June 2002, no evidence exists to indicate that diseases affecting tortoise populations can be transferred to human beings.

Collecting Data on Live Tortoises

- Because so few live tortoises are expected to occur within the Jawbone-Butterbredt ACEC, any live tortoise found within the study area will be processed as described below.

Completing the Field Data Sheet for Live Desert Tortoise

- Researchers shall record all encounters with a tortoise, not just the first encounter, on a fresh Field Data Sheet for Live Desert Tortoise (Appendix D).
    - All spaces on the data sheet must be completed on the first capture and all subsequent captures unless stated otherwise below.

- If additional space is needed, a second data sheet shall be used, not the back side of the first data sheet.

- Before approaching a live tortoise, researchers observe the tortoise from a distance, taking notes on the Field Data Sheet for Live Desert Tortoise.
  - If the tortoise is eating, researchers determine the items being consumed, noting plant food items to the plant species level. If researchers cannot identify a food item to species, a specimen is collected and delivered to a botanist for identification before noting the species on the data sheet.
  - If the tortoise is interacting with another tortoise, researchers identify (by ID number) and sex the other tortoise and describe both tortoises' behavior.
  - When hatchling, juvenile, or immature (<180 mm carapace length) tortoises are encountered, field researcher shall take more detailed general notes on locations, behavior, and feeding habits. In addition, researchers shall intensively search the vicinity for other small tortoises.
- Researchers shall be able to process live tortoises quickly.
  - Researchers record the time processing begins and finishes.
  - Researchers shall aim to process each live tortoise in less than 45 minutes.
  - Under no circumstance shall researchers process a tortoise for more than one hour.
- Before handling a tortoise, researchers can complete several parts of the data sheet:
  - Researchers shall record the location of the tortoise in UTMs.
  - Researchers note whether the tortoise was observed during the North-South or East-West coverage of a plot, or during incidental observations on or off the plot.
  - Researchers shall note the proximity of the tortoise to a cover site and the type, orientation, and location of that cover site. Once the tortoise is taken away from the cover site, researchers shall record the height, width, and depth (in millimeters) of the cover site.
- In handling a live tortoise, researchers shall be sure to record:
  - Measurements of all tortoises.
    - Measurements are taken of the carapace length at the midline (MCL), plastron length from notch to notch, and weight.
    - Measurements are recorded in millimeters and grams.
    - Measurements are always taken on the first encounter of a given year. On subsequent encounters during that year, measurements are taken only if two weeks have passed since the most recent encounter or if there is a specific reason to take new measurements (for example, if the tortoise appears ill).
  - Sex of tortoises greater than 180 mm MCL.
    - Each tortoise is identified as to sex using tail length, chin glands, characteristics of the plastron, and gular horn.
    - If there is a question about the sex, the researcher describes sexual characteristics and takes close-up photographs of those characters.
    - Field researchers shall not leave the space for sexual identity blank on the data sheet.
  - Identity of the tortoise.
    - If a tortoise bears notches or markings researchers shall note the ID number.
    - The locations of any previous or current notches or markings shall be drawn on the diagram of the shell on the data sheet.
    - A new ID number shall be assigned and recorded for all tortoises captured for the first time (see sections on registering, notching, and marking live tortoises).
  - Capture type.

        - Capture type 1: The first time a desert tortoise is captured, marked, and released.
        - Capture type 2: The second time, and all subsequent times, a desert tortoise is captured within a given year.
        - Capture type 3: The first time a marked desert tortoise is captured in a year subsequent to its first capture year.
        - Capture type 4: ?
        - Capture type 5: A marked desert tortoise is found dead.
        - Capture type 6: A desert tortoise was a previous captive (paint on shell, drilled holes in shell for chain or tether) but is found in the wild.
        - Capture type 7: A desert tortoise is salvaged and removed from the study area.
        - Capture type 8: A marked desert tortoise from another study area is found in the Jawbone-Butterbredt ACEC.
    - Abnormalities of the shell.
        - All tortoises with more or less than 11 marginal scutes on each side of the carapace shall be noted and the abnormalities drawn in the diagram of the shell on the data sheet. Because these abnormalities affect the notching and the numbering system, they shall be indicated clearly in the drawing and by notations next to the diagram.
        - Anomalies such as a twisted gular, missing or abnormally shaped nuchal, supernumerary costal, or vertebral scutes shall be drawn clearly on the diagram during the first capture (and any subsequent capture if that condition changes).
        - If the drawing of abnormalities, notches, chips and chews on the previous capture identical to the existing situation, then a new drawing does not need to be prepared. If, however, the status of the tortoise has changed, the illustrations of the carapace and plastron must be re-drawn.

Registering New, Unmarked Tortoises

- Tortoises are permanently marked on the shell using the notching system and methods described in Appendix I. The notches encode a unique number for each tortoise.
- Adult tortoises are assigned numbers consecutively beginning with the latest unassigned number. Juvenile and adult tortoises are notched on anterior and posterior marginal scutes only, never on the "bridge" (the marginal scutes between the fore- and hind-limbs). Appropriate numbers are selected and saved for juvenile and immature tortoises.
- The survey team shall maintain one list of previously assigned numbers for all tortoises in the Jawbone-Butterbredt ACEC and a second list of available numbers.
- All live tortoises are marked with their individually assigned numbers on the fourth right costal scute in the following way:
    - A small spot of correction fluid ("white-out"), less than 1/2 inch in diameter is painted on the scute (away from the areolae) and allowed to dry.
    - The assigned number is written on top of the dry white-out.
    - The number is covered with a small dot of quick-drying epoxy.
    - When the epoxy is dried, some dirt is rubbed over the number to make it less conspicuous to predators.
- If a problem is encountered, researchers shall immediately contact the PI, Dr. Kristin Berry. The PI will devise a plan. Examples of potential problems include but are not limited to:
    - Two tortoises with the same number.
    - Tortoises with more or less than the normal 11 marginal scutes on each side of the carapace

- Tortoises with numbers and notches that must be changed, due to previous errors.

Registering Previously Marked Tortoises

- It is highly unlikely that previously marked tortoises exist in the Jawbone-Butterbredt ACEC before field season 2002. If marked tortoises are found, people may have illegally relocated them from some existing study site, such as the Fremont Valley long-term plot or the Desert Tortoise Natural Area. They may also be released captives.
- It is likely that tortoises marked in 2002 will be recaptured. To avoid confusion about the identity of marked tortoises and the next set of new identification numbers to use, the field researchers will carry a complete list of marked tortoises (a roster) at all times. The roster shall contain:
  - The identification number of the tortoise.
  - Date(s) observed.
  - Capture types, sex, size (MCL in mm), and weight.
  - Location (quadrat or UTMs).
- In some cases, the number will not be legible or will have chipped off or otherwise be partially removed. In such cases, the identification number is replaced. Whenever necessary, notches, numbers and other markings on tortoises shall be remade to ensure future readability.

Preparing a Live Tortoise for Photographing

- Before any action is taken to disturb the shell surface and any potential ectoparasites, researchers shall look for ticks on the shell, skin, and head (including the nares). If any are found, their number, size, and location on the tortoise shall be recorded on the Tortoise Health Assessment (Appendix E). The location on the shell shall be drawn on the figure, digital photographs shall be taken (see below). Specimens of the ectoparasites shall be collected and delivered to the PI, Dr. Kristin Berry, for identification.
- Before photographing the tortoise, researchers shall clean the shell and limbs of the tortoise, using toothbrushes to remove all encrusted dirt and debris. If the tortoise is heavily encased in dried mud, then it might need to be rinsed with water from a canteen.
- Once the tortoise is cleaned, researchers shall evaluate the color of the shell and skin by matching colors from a Munsell Soil Color Chart to specific locations on the tortoise.
  - These locations include:
    - The center of the first vertebral scute.
    - The center of the fourth vertebral scute.
    - The seam of the first and second left costal with the second vertebral scutes.
    - The seam of the fifth and sixth left marginal with the second left costal scutes.
    - Scales on the foreleg.
    - Scales on the hindleg.
  - Color values (HV, Hue, Value, and Chroma) as well as the common name of each color shall be recorded on the Field Data Sheet for Live Desert Tortoise (Appendix D).

Quality of Photographs

- The quality of digital images is critical for accurate identification of the tortoise, assessing status of lesions and trauma, describing the presence or absence or degree of shell disease, and assigning shell wear/aging. Therefore, digital images must be of high quality.
- All 35-mm images taken of tortoises shall have normal color. Exposures shall be neither too dark nor too light. If slides or images are over- or underexposed, then the tortoise must be re-photographed on a subsequent recapture or specially located and re-photographed.
- Slides or images are not taken at a distance from the tortoise.

- Field researchers use flash units at any time when light conditions are not optimal (for example, early in morning or late in the day).

Photographs Taken of All Tortoises:

- Field researchers shall take 35-mm digital images of the carapace, plastron, and posterior, left costal scute of each tortoise.
  - A special ("macro") camera lens for taking close-up images is required.
  - Pictures of the carapace and plastron shall always be taken after the tortoise is notched or renotched.
  - The carapace, plastron, and left costal scute shall fill the field of view of each image.
  - The field researcher places a small sticker (not a scrap of paper) on the edge of the tortoise before each picture is taken.
    - Writing on the sticker shall be in permanent, black ink, and be clearly legible.
    - The sticker shall show the date the picture was taken, the number of tortoise, and the name of plot.
    - If the tortoise was found outside of a plot, "off-plot" is written after the name of the quadrat.
    - The sticker shall not block valuable information about scute shapes or anomalies. The sticker must be placed on the edge of the tortoise or scute.
  - The slides or digital images are of a quality such that:
    - For the carapace, the seams are clear and visible between most costal and vertebral scutes, and growth rings and areolae, if present, are clearly visible.
    - For the plastron, the seam along the midline of the tortoise is clearly visible, as are the seams between gular and humeral scutes, humeral and pleural scutes, and so on to the posterior of the tortoise. The growth rings and areolae, if present, are clearly visible.
    - For the posterior costal scute, growth rings and areolae shall be clearly visible and easily delineated, if present.
- Field researchers shall take close-up digital photographs of the right eye, periocular area and beak (right side of face), left eye and periocular area (left side of face), and a frontal view of the nares and beak. If a tortoise does not extend its head, these photographs cannot be taken.

Completing the Tortoise Health Assessment

- For each encounter of each live tortoise, the field researcher carefully examines the tortoise and fills out a special form describing the apparent health of the tortoise (Tortoise Health Assessment, Appendix E). The time estimated to fill out this form for an experienced field researcher is 5 -10 minutes. The form must be filled out in the field, while the field researcher is examining the tortoise. It cannot be filled out later using "cuff" or other notes. All portions of the form must be filled out for each encounter. The plastron, limbs, and head of the tortoise shall be examined, at least those parts of the limbs and head that are visible and protruding from the shell. If at all possible, the mouth shall be opened and the presence of sores, ulcers, abrasions, or discolorations inside the mouth and on the tongue are noted, described in detail, and photographed.
- The form includes, but is not limited to, such critical subjects as: the presence or absence of a nasal discharge; the color and opacity of the discharge; whether the nares are occluded; exudation of chin gland material; whether eyes are sunken and wet, and/ or crusted; whether the tortoise is listless and relatively inactive; whether caked dirt is on or near the nostrils or on the forelegs; presence of signs of shell disease; etc. Signs of trauma, injuries and disease to the shell or limbs are drawn on the diagram of the form.

- The locations of ectoparasites are drawn onto the form. They are photographed and specimens collected both for identification and for determination whether they are carrying diseases of concern to humans, tortoises, or other animals.
- If a tortoise is recaptured on the same day as a previous capture, when both the Field Data Sheet for Live Desert Tortoise and Tortoise Health Assessment were filled out, then a second Tortoise Health Assessment does not need to be filled out unless there is a change in the health of the tortoise (for example, new nasal drainage).
- At this time, field researchers will not be collecting blood and taking nasal lavages for analysis of mycoplasmosis, herpes, and other diseases. These activities may only be undertaken under the supervision of the PI, Dr. Kristin Berry, Tracy Okamoto or Kemp Anderson.

Photographing Symptoms of Tortoise Diseases

- If a tortoise has unusual anomalies or injuries, (for example, a missing limb), researchers shall photograph those anomalies or injuries, using a macro lens where necessary.
- If the tortoise has mold or lesions on the shell, researchers shall photograph those lesions with a macro lens.
- If the tortoise has wet and draining eyes, encrusted eyes, draining or wet chin glands, swollen eyes, or occluded nostrils, researchers shall photograph those features with a macro lens.
- If the tortoise has ectoparasites anywhere on its body, researchers shall photograph those organisms with a macro lens.
- If scales on the forelegs are peeling, appear chewed or diseased (e.g., cutaneous dyskeratosis), researchers shall photograph the appropriate foreleg scales with a macro lens.
- Researchers shall photograph any feature that might be a symptom of disease or trauma, using a macro lend where necessary.

Salvaging Ill and Dying Tortoises

- A separate protocol has been developed for identifying ill and dying tortoises and salvaging these tortoises (Appendix J). It is possible that the survey team will salvage a tortoise during the 2002 field season, such as a road kill in the non-urban portions of Indian Wells Valley, along State Highway 14 or along the Red Rock-Garlock Road.
- The following are examples of clinical signs of disease that warrant salvage:
    - Purulent discharge from the nares (white, cloudy, yellow, or green).
    - Emaciated, cachectic; lethargic, lack of responsiveness.
    - Moderate to severe shell lesions, possibly accompanied by exposure of bone or loss of scute and bone.
    - Exposure of bone or underlying tissue from shell lesions, even if shell lesions appear to cover only a small part of the shell (< 10%).

Task 5: Processing Tortoise Shell-Skeletal Remains

Tortoise Remains On vs. Off Plots

- Researchers shall document all tortoise remains found on or off plots. Researchers shall note on the Field Data Sheet for Shell-Skeletal Remains of Desert Tortoise (Appendix F) if remains are found on or off a plot. All tortoise remains found on plots shall be collected. Tortoise remains found off plots shall be collected until that number exceeds 100.
- The only exception is made for tortoise remains found in predator scat. In searching for tortoise remains in scat, researchers shall only examine scat found on plots.

Documenting and Photographing Dead Tortoises and Shell-Skeletal Remains

- After discovering tortoise remains or parts of remains, researchers shall carefully search the vicinity for signs of the potential causes of death (for example, trail or tracks of vehicles, human footprints, or evidence of predators). The field researchers take care not to obscure the evidence of cause of death by trampling the site.
- Field researchers shall make digital images of the remains *in situ*, taking as many slides as necessary to document the setting where death may have occurred. If the remains are found in a situation where the tortoise might have been injured or died due to a human-related impact (for example, vehicle use, wild horses or burros, or vandalism), then additional digital images are made.
- Once the site has been photographed, researchers shall search for additional body parts or evidence (bones and scutes). Body parts may be 15 to 30 m away. Careful searching is critical.
- At least three digital images are taken of each shell or skeletal remain prior to disturbance.
  1. A general picture showing the remains within the context of soils, vegetation, and land uses (if any).
  2. A close-up of the remains, filling the frame.
  3. A close-up image (filling the frame) of the oldest and most deteriorated portion of the scutes and bones.
  - If the remains are widely scattered over many square meters, representative portions of the remains are photographed.
  - A sticker or index card (not a scrap of paper) with the date, number of shell, and quadrat number written in permanent black ink is placed in each image.
- After photographing the remains, researchers collect all parts. Tortoise remains shall be collected when they are first discovered, not days or months later. Researchers will make an effort to reassemble pieces and to document which bones and scutes are present and intact before returning from the field (in case pieces are broken in transit). All pieces are described and drawn on the diagrams on the Field Data Sheet for Shell-Skeletal Remains of Desert Tortoise (Appendix F). Measurements are similar to those on the Field Data Sheet for Live Desert Tortoise.
- When researchers have identified as many pieces as possible, all pieces are placed in a heavy-duty Ziploc bag. After returning from the field, researchers shall make a copy of each Field Data Sheet for Shell-Skeletal Remains of Desert Tortoise and place that copy in a second heavy-duty Ziploc bag with the remains (in their own bag). All original data sheets are placed in a separate folder and at no time are placed with or touch the remains.

Processing Marked, Dead Tortoises

- All remains of dead tortoises with notches or marks showing that the tortoise was marked in previous surveys are assigned to Capture type 5. In addition to a Field Data Sheet for Shell-Skeletal Remains of Desert Tortoise (Appendix F), a Field Data Sheet for Live Desert Tortoise (Appendix D) is also completed for each of these marked, dead tortoises.

Examining and Collecting Predator Scat Containing Tortoise Remains

- Common predators of desert tortoise include coyote, badger, bobcat, kit fox, and spotted skunk. Researchers shall examine all predator scats *found on plots* for remains of tortoises. Each scat is broken apart and checked visually.
- Researchers shall collect all predator scat that contains tortoise remains. Researchers shall place each scat or group of scat (found at one site and assigned to a single predator) in a Ziploc bag.
- Each Ziploc bag of predator scat is treated as a set of tortoise remains. Researchers shall

complete a Field Data Sheet for Shell-Skeletal Remains of Desert Tortoise. A copy of the original data sheet shall be placed in the Ziploc bag. At no time is the original data sheet placed in the Ziploc bag.

- Researchers do *not* need to photograph each piece of scat *in situ*, but may photograph representative examples.

Managing Single Pieces of Bone or Scute Found on Plots

- Whenever single pieces (not associated with a particular set of remains) are discovered, the individual pieces shall be sorted by plot. Researchers shall record the UTMs where each piece is found. Pieces found within a given plot are placed together in a Ziploc bag.
- Researchers do not need to photograph each piece*in situ*.
- Each bag of pieces shall have a single Field Data Sheet for Shell-Skeletal Remains of Desert Tortoise completed. A copy of that data sheet shall be placed in the bag with the pieces and the original in the general file.

Managing Fresh and Putrefying Remains

- In rare cases, researchers will encounter a tortoise that has died a few hours or days before, with remaining soft parts that are putrefying. If the tortoise has been dead several hours and is still relatively fresh, the remains are salvaged immediately (see Appendix H). The remains are placed on ice in a styrofoam container. Researchers shall contact the PI, Dr. Kristin Berry, immediately. Measures are taken to transfer the remains as soon as possible for necropsy.
- If the remains have decayed to the point of putrefaction and are beyond salvage of soft parts, the researcher gathers the appropriate data and photographs (as for any other tortoise remains). The researcher places the remains at a site where they will dry but be protected from transport or removal by scavengers (for example, under a cairn of rocks or in a cage). These remains are allowed to dry until they can be transported to the PI, Dr. Kristin Berry, at the USGS Biological Resources Division office in Riverside, California.

Task 6: Documenting Areas of Predator Sign Concentrations

- Frequently observed areas of predator sign concentrations include:
  - Coyote and kit fox dens (often have multiple entrances)
  - Concentrations of predator scats (at least 10 scats within 10 square meters)
  - Raptor nests and perch sites (white wash or nest debris observed)
- Researchers document all areas of predator sign concentrations found on or off a plot. Researchers complete a Field Data Sheet for Area of Predator Sign Concentration (Appendix G) for each area, noting if the area is on or off a plot.
- Each area of predator sign concentration shall be assigned an ID number, beginning with PSC-1 each day.
- If surveys occur on the same plot (or if for any other reason an area of predator sign concentration is observed a second time), researchers shall determine whether any changes have occurred in the condition and level of predator activity. Changes shall be noted on a new Field Data Sheet for Area of Predator Sign Concentration noting the first date the area was observed and the original ID Number.
- Researchers may conduct additional searches for signs of tortoise at areas of predator sign concentration. These searches shall include, but are not limited to:
  - Base of power towers
  - Fence posts and fence lines
  - Below golden eagle, raven and shrike nests

Task 5: Documenting Observations of Avian Predators

- Researchers shall document any observations of Burrowing Owls, Red-tailed Hawks, Greater Roadrunners, Loggerhead Shrikes, Great-horned Owls, Northern Harriers, Golden Eagles, Prairie Falcons, and Common Ravens on an Avian Predator Form (Appendix H).
- An Avian Predator Form shall be maintained for each region over the course of the field season. Researchers record the date, time, and location (in UTMs) of each observation.
- Observations of avian predators may lead researchers to areas of predator sign concentration and/or tortoise remains, which shall be processed and documented as described above.
- Observations of sensitive species of birds shall be added to the Desert Monitoring Team's database for sensitive species and sent to the Biological Diversity Database for California Department of Fish and Game in Sacramento.

Appendices*

Appendix A: Journal (2 pages)
Appendix B: Human-Related Disturbance Sheet
Appendix C: Field Data Sheet for Tortoise Sign
Appendix D: Field Data Sheet for Live Desert Tortoise
Appendix E: Tortoise Health Assessment
Appendix F: Field Data Sheet for Shell-Skeletal Remains of Desert Tortoise
Appendix G: Field Data Sheet for Area of Predator Sign Concentration
Appendix H: Avian Predator Form
Appendix I: Notching System for Live Tortoises
Appendix J: Protocol for Salvaging Ill or Dying Tortoises
Appendix K: Equipment List for Field Crew

*For copies of all the data sheets (appendices A-H), please see the Microsoft Excel file, "JawboneTortoiseDataSheets".

Appendix K: Equipment List for Field Survey Team

Clipboard
Data sheets (archival paper):
- Journal (2 pages)
- Human-Related Disturbance Sheet
- Field Data Sheet for Tortoise Sign
- Field Data Sheet for Live Desert Tortoise
- Tortoise Health Assessment
- Field Data Sheet for Shell-Skeletal Remains of Desert Tortoise
- Field Data Sheet for Area of Predator Sign Concentration
- Avian Predator Form

Roster of Previously Marked Tortoises
Protocol
Pens (2) black, fine-tipped
Marking pens (blue or black)
GPS, preferably GeoExplorer3
Watch
Mercury thermometer
Eight-foot flagged pole (made of 1-inch PVC pipe sharpened at one end) (8)
Digital Camera w/ Macro Lenses and Flash
Index Cards
Sheet of small stickers
Signal mirrors (2)
Metal probe (6-foot)
Ruler (45-mm)
Calipers, large
Calipers, small
Scales (3 sizes)
Surveying Tape
Disposable rubber gloves (5-10 pairs)
Toothbrush
Plastic Ziploc bags (various sizes)
Dilute solution of bleach
Metal files (2)
Fingernail clippers
White-out
Quick-drying epoxy
Munsell Soil Color Chart

Part II: Progress Report of Desert Tortoise Survey in the Jawbone Butterbredt ACEC

This part of the document briefly summarizes the results of the first two years (2002, 2003) of the Desert Tortoise survey being carried out by the ECO Desert Monitoring Team in the Jawbone-Butterbredt ACEC. About 35% (277 of 777 plots) of the survey has been completed.

Search Effort

There have been 67 days spent in the field. Most days, two field scientists went out, but there were 10 days on which 3 or 4 people went out. A total of 713 person-hours were spent in the field. 332 of these hours were spent searching plots, and an additional 53 hours were spent processing tortoise sign. The remainder of the field time was spent walking to and from the plots and setting up and taking down the plots. In addition to this field time, approximately 200 person-hours were spent in travel and approximately 30 hours in data entry.

Plot Summary

The following table indicates the number of plots in which different types of tortoise sign were found. Less than 10% of the plots had any kind of sign and less than 1% of the plots had live tortoises. The percentages of sign found on the plots in the Kiavah Apron area are almost certainly higher than the final percentages will be because we have focused on plots in an area with a small tortoise population around Robber's Roost.

Table 1: Plot Summary

	Total	Blackbrush	Indian Wells	Kiavah Apron	Red Rock	S.Dove Springs
Total Plots	777	409	137	161	39	31
Plots Searched	277	126	22	94	31	4
Plots with Sign	25	1*	1*	17	6	0
Plots with Cover Sites	17	1*	1*	10	5	0
Plots with Scat	17	0	0	16	1	0
Plots with Footprints	2	0	0	2	0	0
Plots with Live Tortoise	1	0	0	1	0	0
Plots with Remains	0	0	0	0	0	0

* The only sign found in the Blackbrush and Indian Wells areas were class 5 tortoise burrows. Class 5 burrows are long abandoned burrows in serious need of reconstruction; they could easily be confused with old burrows of another species. It is very possible (given the inexperience of the survey team) that they were not, in fact, tortoise burrows.

Sign Summary

The following table summarizes all the sign found, both on plots and off plots.

Table 2: Sign Summary

Blackbrush Indian Wells Kiavah Apron Red Rock S.Dove Springs Total on off Total on off Total on off Total on off Total on off Live Tortoises 3 1 2 0 0 0 0 0 0 3 1 2 0 0 0 0 0 0 Tortoise Remains 8 0 8 0 0 0 0 0 0 0 0 8 0 8 0 0 0 Cover Sites 53 26 27 1* 1* 0 2* 2* 0 36 16 20 14 7 7 0 0 0 Tortoise Scat 107 53 54 0 0 0 0 0 0 96 52 44 10 1 9 0 0 0 Footprints 7 3 4 0 0 0 0 0 0 6 3 3 1 0 1 0 0 0 *See note above for Table 1.

Human Disturbance Summary

The following table summarizes most of the human disturbance that we have found on the plots.

Table 3: Human Disturbance Summary

	Total	Blackbrush	Indian Wells	Kiavah Apron	Red Rock	S.Dove Springs
Plots Searched	277	126	22	94	31	4
Plots with 4-wheel drive tracks	76	46	3	18	8	1
Plots with motorcycle tracks	103	55	7	29	10	2
Plots with garbage (general)	165	69	15	51	26	4
Plots with bullet casings	131	68	4	39	16	4
Plots with shooting targets	22	10	0	6	6	0
Plots with cattle scat	256	126	22	92	14	2
Plots with balloons	79	40	6	21	12	0

Part III: Raw Data for 2002-2003

Table A: Plots searched

UTM's are in datum NAD87; these are the coordinates for the Southwest corner of the plot. Codes for "Tortoise" column: 1 = no sign of tortoise, 2 = tortoise sign observed, none indicating presence within the last year, 3 = tortoise sign observed indicating presence within last year, 5 = possibly tortoise present (cover site condition 4 or 5).

Graticule	Quadrat	Region	Plot SW Easting	Plot SW Northing	Tortoise
2498	CAC18V	Blackbrush	398200	3933500	1
3410	DOS01J	Blackbrush	403400	3928300	1
3411	DOS01K	Blackbrush	403500	3928400	1
3413	DOS01M	Blackbrush	404700	3928200	1
3414	DOS01N	Blackbrush	405300	3928400	1
3415	DOS01O	Blackbrush	405500	3928200	1
3485	DOS02C	Blackbrush	399800	3927500	1
3495	DOS02M	Blackbrush	404500	3927800	1
3496	DOS02N	Blackbrush	405400	3927500	1
3497	DOS02O	Blackbrush	405700	3927800	1
3567	DOS03C	Blackbrush	399900	3927300	5
3568	DOS03D	Blackbrush	400100	3927200	1
3650	DOS04D	Blackbrush	400300	3926800	1
3651	DOS04E	Blackbrush	400500	3926900	1
3662	DOS04P	Blackbrush	406400	3926500	1
3734	DOS05F	Blackbrush	401400	3926300	1
3736	DOS05H	Blackbrush	402300	3926200	1
3737	DOS05I	Blackbrush	402600	3926100	1
3743	DOS05O	Blackbrush	405700	3926100	1
3744	DOS05P	Blackbrush	406100	3926100	1
3745	DOS05Q	Blackbrush	406500	3926400	1
3818	DOS06H	Blackbrush	402200	3925900	1
3819	DOS06I	Blackbrush	402700	3925800	1
3820	DOS06J	Blackbrush	403100	3925500	1
3900	DOS07H	Blackbrush	402400	3925400	1
3901	DOS07I	Blackbrush	402700	3925200	1
3902	DOS07J	Blackbrush	403400	3925400	1
3909	DOS07Q	Blackbrush	406900	3925000	1
3910	DOS07R	Blackbrush	407000	3925000	1
3984	DOS08J	Blackbrush	403300	3924800	1
3987	DOS08M	Blackbrush	404700	3924700	1
3988	DOS08N	Blackbrush	405100	3924500	1
3989	DOS08O	Blackbrush	405700	3924500	1
3991	DOS08Q	Blackbrush	406700	3924600	1
3992	DOS08R	Blackbrush	407100	3924500	1
3993	DOS08S	Blackbrush	407500	3924600	1
4069	DOS09M	Blackbrush	404600	3924000	1
4070	DOS09N	Blackbrush	405300	3924400	1
4071	DOS09O	Blackbrush	405800	3924200	1
4073	DOS09Q	Blackbrush	406600	3924300	1
4074	DOS09R	Blackbrush	407000	3924300	1
4075	DOS09S	Blackbrush	407500	3924100	1
4150	DOS10L	Blackbrush	404300	3923900	1
4151	DOS10M	Blackbrush	404700	3923900	1
4152	DOS10N	Blackbrush	405000	3923800	1
4153	DOS10O	Blackbrush	405900	3923600	1
4154	DOS10P	Blackbrush	406100	3923500	1
4155	DOS10Q	Blackbrush	406700	3923700	1
4156	DOS10R	Blackbrush	407000	3923500	1
4157	DOS10S	Blackbrush	407500	3923900	1
4235	DOS11O	Blackbrush	405700	3923000	1
4236	DOS11P	Blackbrush	406100	3923400	1

4237	DOS11Q	Blackbrush	406700	3923200	1
4238	DOS11R	Blackbrush	407300	3923000	1
4239	DOS11S	Blackbrush	407800	3923400	1
4240	DOS11T	Blackbrush	408000	3923300	1
4309	DOS12G	Blackbrush	401800	3922500	1
4319	DOS12Q	Blackbrush	406600	3922600	1
4320	DOS12R	Blackbrush	407100	3922800	1
4321	DOS12S	Blackbrush	407900	3922800	1
4322	DOS12T	Blackbrush	408100	3922900	1
4390	DOS13F	Blackbrush	401000	3922200	1
4391	DOS13G	Blackbrush	401500	3922200	1
4392	DOS13H	Blackbrush	402100	3922300	1
4402	DOS13R	Blackbrush	407400	3922100	1
4403	DOS13S	Blackbrush	407700	3922300	1
4472	DOS14F	Blackbrush	401200	3921800	1
4473	DOS14G	Blackbrush	401500	3921900	1
2013	HRC12G	Blackbrush	401700	3936500	1
2095	HRC13G	Blackbrush	401800	3936400	1
2096	HRC13H	Blackbrush	402200	3936000	1
2097	HRC13I	Blackbrush	402500	3936300	1
2098	HRC13J	Blackbrush	403400	3936100	1
2184	HRC14N	Blackbrush	405200	3935900	1
2185	HRC14O	Blackbrush	405500	3935800	1
2186	HRC14P	Blackbrush	406100	3935800	1
2264	HRC15L	Blackbrush	404200	3935200	1
2265	HRC15M	Blackbrush	404800	3935200	1
2266	HRC15N	Blackbrush	405300	3935000	1
2267	HRC15O	Blackbrush	405700	3935400	1
2268	HRC15P	Blackbrush	406100	3935100	1
2346	HRC16L	Blackbrush	404200	3934800	1
2347	HRC16M	Blackbrush	404500	3934900	1
2352	HRC16R	Blackbrush	407100	3934500	1
2432	HRC17P	Blackbrush	406200	3934000	1
2433	HRC17Q	Blackbrush	406600	3934000	1
2434	HRC17R	Blackbrush	407300	3934300	1
2435	HRC17S	Blackbrush	407600	3934300	1
2499	HRC18A	Blackbrush	398900	3933800	1
2500	HRC18B	Blackbrush	399100	3933700	1
2501	HRC18C	Blackbrush	399800	3933700	1
2502	HRC18D	Blackbrush	400200	3933800	1
2503	HRC18E	Blackbrush	400800	3933800	1
2514	HRC18P	Blackbrush	406400	3933900	1
2515	HRC18Q	Blackbrush	406500	3933700	1
2516	HRC18R	Blackbrush	407200	3933600	1
2581	HRC19A	Blackbrush	398800	3933400	1
2582	HRC19B	Blackbrush	399200	3933300	1
2585	HRC19E	Blackbrush	400700	3933400	1
2666	HRC20D	Blackbrush	400400	3932700	1
2667	HRC20E	Blackbrush	400600	3932800	1
2748	HRC21D	Blackbrush	400300	3932400	1
2749	HRC21E	Blackbrush	400500	3932100	1
2750	HRC21F	Blackbrush	401100	3932200	1
2751	HRC21G	Blackbrush	401600	3932200	1
2831	HRC22E	Blackbrush	400900	3931800	1
2832	HRC22F	Blackbrush	401100	3931900	1
2833	HRC22G	Blackbrush	401700	3931500	1
2834	HRC22H	Blackbrush	402100	3931700	1
2835	HRC22I	Blackbrush	402600	3931600	1
2838	HRC22L	Blackbrush	404400	3931800	1
2839	HRC22M	Blackbrush	404500	3931700	1

2840	HRC22N	Blackbrush	405000	3931500	1
2917	HRC23I	Blackbrush	402500	3931400	1
2923	HRC23O	Blackbrush	405500	3931200	1
3081	HRC25I	Blackbrush	402700	3930200	1
3163	HRC26I	Blackbrush	402800	3929800	1
3164	HRC26J	Blackbrush	403400	3929600	1
3166	HRC26L	Blackbrush	404100	3929600	1
3167	HRC26M	Blackbrush	404800	3929600	1
3169	HRC26O	Blackbrush	405500	3929500	1
3248	HRC27L	Blackbrush	404000	3929000	1
3250	HRC27N	Blackbrush	405400	3929400	1
3329	HRC28K	Blackbrush	403900	3928600	1
3330	HRC28L	Blackbrush	404300	3928800	1
4136	PIM10T	Blackbrush	397200	3923700	1
2364	FRJ16H	Indian Wells	413000	3934700	1
2365	FRJ16I	Indian Wells	413600	3934800	5
2366	FRJ16J	Indian Wells	414000	3934600	1
2446	FRJ17H	Indian Wells	413200	3934100	1
2447	FRJ17I	Indian Wells	413600	3934300	1
2448	FRJ17J	Indian Wells	414100	3934000	1
2526	FRJ18F	Indian Wells	412400	3933600	1
2527	FRJ18G	Indian Wells	412600	3933600	1
2608	FRJ19F	Indian Wells	412200	3933400	1
2609	FRJ19G	Indian Wells	412600	3933200	1
2610	FRJ19H	Indian Wells	413200	3933000	1
2688	FRJ20D	Indian Wells	411300	3932500	1
2689	FRJ20E	Indian Wells	411600	3932800	1
2690	FRJ20F	Indian Wells	412000	3932800	1
2691	FRJ20G	Indian Wells	412500	3932800	1
2692	FRJ20H	Indian Wells	413300	3932500	1
2770	FRJ21D	Indian Wells	411000	3932400	1
2771	FRJ21E	Indian Wells	411800	3932200	1
2772	FRJ21F	Indian Wells	412000	3932200	1
2773	FRJ21G	Indian Wells	412800	3932200	1
2774	FRJ21H	Indian Wells	413300	3932400	1
2775	FRJ21I	Indian Wells	413900	3932200	1
1215	FRJ02G	Kiavah Apron	412600	3941800	1
1216	FRJ02H	Kiavah Apron	413400	3941800	1
1297	FRJ03G	Kiavah Apron	412900	3941400	1
1298	FRJ03H	Kiavah Apron	413400	3941000	1
1379	FRJ04G	Kiavah Apron	412500	3940700	1
1380	FRJ04H	Kiavah Apron	413200	3940600	1
1381	FRJ04I	Kiavah Apron	413500	3940500	1
1461	FRJ05G	Kiavah Apron	412500	3940300	1
1462	FRJ05H	Kiavah Apron	413200	3940300	1
1463	FRJ05I	Kiavah Apron	413900	3940400	1
1464	FRJ05J	Kiavah Apron	414100	3940200	3
1465	FRJ05K	Kiavah Apron	414800	3940300	1
1466	FRJ05L	Kiavah Apron	415400	3940100	1
1543	FRJ06G	Kiavah Apron	412700	3939500	1
1544	FRJ06H	Kiavah Apron	413300	3939700	2
1545	FRJ06I	Kiavah Apron	413500	3939700	3
1546	FRJ06J	Kiavah Apron	414000	3939500	2
1547	FRJ06K	Kiavah Apron	414900	3939500	2
1548	FRJ06L	Kiavah Apron	415000	3939500	1
1622	FRJ07D	Kiavah Apron	411100	3939100	2
1625	FRJ07G	Kiavah Apron	412700	3939100	1
1626	FRJ07H	Kiavah Apron	413200	3939000	1
1629	FRJ07K	Kiavah Apron	414600	3939300	1
1630	FRJ07L	Kiavah Apron	415100	3939300	1

1703	FRJ08C	Kiavah Apron	410500	3938600	1
1704	FRJ08D	Kiavah Apron	411300	3938700	1
1705	FRJ08E	Kiavah Apron	411500	3938700	1
1706	FRJ08F	Kiavah Apron	412000	3938600	1
1707	FRJ08G	Kiavah Apron	412800	3938700	3
1708	FRJ08H	Kiavah Apron	413300	3938500	2
1710	FRJ08J	Kiavah Apron	414000	3938700	3
1785	FRJ09C	Kiavah Apron	410500	3938000	1
1786	FRJ09D	Kiavah Apron	411100	3938100	1
1787	FRJ09E	Kiavah Apron	411700	3938100	1
1788	FRJ09F	Kiavah Apron	412100	3938200	1
1789	FRJ09G	Kiavah Apron	412500	3938300	3
1790	FRJ09H	Kiavah Apron	413300	3938100	1
1792	FRJ09J	Kiavah Apron	414000	3938000	3
1793	FRJ09K	Kiavah Apron	414600	3938000	1
1866	FRJ10B	Kiavah Apron	410100	3937800	1
1867	FRJ10C	Kiavah Apron	410800	3937900	1
1868	FRJ10D	Kiavah Apron	411100	3937800	1
1869	FRJ10E	Kiavah Apron	411800	3937600	3
1870	FRJ10F	Kiavah Apron	412200	3937700	2
1871	FRJ10G	Kiavah Apron	412500	3937600	1
1872	FRJ10H	Kiavah Apron	413200	3937800	1
1874	FRJ10J	Kiavah Apron	414200	3937900	2
1947	FRJ11A	Kiavah Apron	409600	3937100	1
1948	FRJ11B	Kiavah Apron	410200	3937000	1
1949	FRJ11C	Kiavah Apron	410600	3937200	2
1950	FRJ11D	Kiavah Apron	411200	3937400	1
1951	FRJ11E	Kiavah Apron	411800	3937000	3
1952	FRJ11F	Kiavah Apron	412300	3937400	1
1953	FRJ11G	Kiavah Apron	412800	3937100	1
1954	FRJ11H	Kiavah Apron	413100	3937300	1
2029	FRJ12A	Kiavah Apron	409800	3936800	1
2030	FRJ12B	Kiavah Apron	410200	3936600	1
2031	FRJ12C	Kiavah Apron	410800	3936800	1
2032	FRJ12D	Kiavah Apron	411100	3936600	1
2033	FRJ12E	Kiavah Apron	411600	3936700	1
2034	FRJ12F	Kiavah Apron	412100	3936800	2
2035	FRJ12G	Kiavah Apron	412700	3936500	1
2036	FRJ12H	Kiavah Apron	413000	3936700	1
2112	FRJ13B	Kiavah Apron	410400	3936000	1
2113	FRJ13C	Kiavah Apron	410800	3936200	1
2114	FRJ13D	Kiavah Apron	411300	3936100	1
2115	FRJ13E	Kiavah Apron	411600	3936000	1
2116	FRJ13F	Kiavah Apron	412200	3936200	1
2193	FRJ14A	Kiavah Apron	409600	3935800	1
2194	FRJ14B	Kiavah Apron	410100	3935700	1
2195	FRJ14C	Kiavah Apron	410900	3935800	1
1206	HRC02T	Kiavah Apron	408400	3941700	1
1207	HRC02U	Kiavah Apron	408800	3941700	1
1208	HRC02V	Kiavah Apron	409000	3941600	1
1289	HRC03U	Kiavah Apron	408600	3941400	1
1290	HRC03V	Kiavah Apron	409400	3941100	1
1946	HRC11V	Kiavah Apron	409400	3937000	1
2023	HRC12Q	Kiavah Apron	406600	3936500	1
2105	HRC13Q	Kiavah Apron	406600	3936400	1
2106	HRC13R	Kiavah Apron	407400	3936300	1
2107	HRC13S	Kiavah Apron	407600	3936100	1
2188	HRC14R	Kiavah Apron	407400	3935700	1
2189	HRC14S	Kiavah Apron	407800	3935900	1
2190	HRC14T	Kiavah Apron	408400	3935800	1

2191	HRC14U	Kiavah Apron	408500	3935600	1
2192	HRC14V	Kiavah Apron	409400	3935500	1
2271	HRC15S	Kiavah Apron	407800	3935000	1
2272	HRC15T	Kiavah Apron	408400	3935100	1
2273	HRC15U	Kiavah Apron	408900	3935300	1
717	OWP05A	Kiavah Apron	409500	3944900	1
799	OWP06A	Kiavah Apron	409600	3944100	1
800	OWP06B	Kiavah Apron	410000	3944100	1
1049	OWP09E	Kiavah Apron	411900	3942700	1
1050	OWP09F	Kiavah Apron	412100	3942700	1
5799	CIN02U	Red Rock	408900	3913500	1
5882	CIN03V	Red Rock	409400	3913200	1
5961	CIN04S	Red Rock	407500	3912500	1
5964	CIN04V	Red Rock	409200	3912600	1
6043	CIN05S	Red Rock	407500	3912300	1
6046	CIN05V	Red Rock	409300	3912200	1
6620	CIN12V	Red Rock	409200	3908700	5
5883	CTL03A	Red Rock	409500	3913200	1
5884	CTL03B	Red Rock	410000	3913300	1
5966	CTL04B	Red Rock	410400	3912500	1
6211	CTL07A	Red Rock	409600	3911400	1
6212	CTL07B	Red Rock	410400	3911200	1
6213	CTL07C	Red Rock	410500	3911300	1
6294	CTL08B	Red Rock	410300	3910600	1
6377	CTL09C	Red Rock	410500	3910400	1
6457	CTL10A	Red Rock	409800	3909600	1
5061	DOS21U	Red Rock	408600	3918100	3
5305	DOS24S	Red Rock	407900	3916800	2
5386	DOS25R	Red Rock	407300	3916200	1
5469	DOS26S	Red Rock	407500	3915600	3
5550	DOS27R	Red Rock	407200	3915400	1
5554	DOS27V	Red Rock	409300	3915200	3
5067	SNW21E	Red Rock	411500	3918100	1
5148	SNW22D	Red Rock	411300	3917900	1
5149	SNW22E	Red Rock	411600	3917600	1
5309	SNW24A	Red Rock	409800	3916700	1
5391	SNW25A	Red Rock	409500	3916400	1
5473	SNW26A	Red Rock	409700	3915700	1
5474	SNW26B	Red Rock	410200	3915600	1
5555	SNW27A	Red Rock	409500	3915300	2
5556	SNW27B	Red Rock	410300	3915200	1
5137	DOS22O	South Dove Springs	405900	3917800	1
5218	DOS23N	South Dove Springs	405200	3917300	1
5219	DOS23O	South Dove Springs	405600	3917000	1
5382	DOS25N	South Dove Springs	405400	3916100	1

Table B: Live Tortoises

Date is in the format YYYYMMDD. UTM's are in datum NAD87. "SWC" is Shell Wear Class, a system of quantifying shell wear with rankings from 1 to 7. "MCL" is Median Carapace Length and is expressed in millimeters. Weight is expressed in grams.
ID#DateQuadratOnPlotUTMEastUTMNorthSWC SexMCLWeightLocationActivityB320020724FRJ10EY411863939376736F2602700 Inside burrowRestingB1120020726FRJ10EN411935939378006M2904600Inside burrowInteracting with tortoise B3 B1320030827FRJ09IN413996393805356F2251950Inside burrowResting

Table C: Distinguishing Features of Live Tortoises

ID#	Distinguishing features
B3	The frist and second right marginal scutes are partially cracked and missing.
B11	There is an L-shaped line (old trauma?) along the right abdominal. There is a notch along the underside of the right side of the gular.
B13	There is a possible old notch on the rear marginal scute. There are small chips on the following marginal scutes: L2, L8, L9, L11, R2, R8, R9, R10.

Table D: Health Problems of Live Tortoises

ID#	Health
B3	Some dried flaking skin around eyes. Trauma noted on first and second right marginals.
B11	There are 2 crushed scales on the right forelimb. The right and left chin glands are swollen. The 2nd and 3rd vertebral scutes are concave. See Distinguishing features.
B13	There was exposed bone on following marginal scutes: L2, L8, R10.

Table E: Shell-Skeletal Remains

Date is in the format YYYYMMDD. UTM's are in datum NAD87. "Carc#" is short for Carcass Number: carcasses found on a given day are numbered sequentially beginning with 1, so that the date and the carcass number uniquely identify each carcass. "MCL" is Median Carapace Length and is expressed in millimeters. "SWC" is Shell Wear Class, a system of quantifying shell wear with rankings from 1 to 7.

DateQuadratOn?UTM EastUTM NorthCarc#CategoryMCLSWCTimeSinceDeathSexLocationPreliminary Assesment Cause of Death
20020605CTL12AN4098523908843 1Partial shell9722-4 years4UnkOpen Unknown.20020709SNW21DN4111633918166 1Partial shell
197 > 4 yearsUnkOpenUnknown.20020715DOS27VN4090623915323 1Partial shell5311-2 yearsUnkOpenAvian predation.
20020724CTL08CN4105693107833Partial shell2333> 4 yearsUnkUnder shrubUnknown.20020724CTL08BN4103463910579 1Entire
shell21532-4 yearsMOpenPossible predator gnawing and bite hole or possible bullet hole20020724CTL08BN4101913910548 2Partial
shell2203>4 yearsUnkUnder shrubUnknown.20021015CIN04TN4081403912581 2Entire shell2103> 4 yearsUnkOpenUnknown.
20021015CIN04UN4085423912648 1Partial shell2334> 4 yearsFOpen, under scrubUnknown.

Table F: Tortoise Cover Sites

Date is in the format YYYYMMDD. UTM's are in datum NAD87. Width, Height and Length are all in millimeters. Sizes are Adult, Immature, or Juvenile. Condition codes: 1=active now, 2=used within last year, 3=could be walked or plowed into and used immediately, 4=excavation necessary,structural degredation, 5=major construction effort necessary for use

DateQuadratOn plot?UTM EastUTM NorthIDTypeWidthHeightLengthSizeCond.Notes20020605CIN12VY4092903908785 2Burrow Adult5200205 60 5CTL12AN4096083908888 21Burrow Adult2Predator sign near burrow: excavation by coyote? kit fox?
20020611FRJ16IY4136153934802 1Burrow19080 Adults200206111FRJ16IY4136493934865 2Burrow180120610Adult5
20020612OWP09EN4119863942805 1Pallet14090180Imm.320020618FRJ06IY4135443939735 2Burrow310140310Adult2
20020618FRJ06IN4135483939663 1Burrow3801901520Adult220020618FRJ06HN4133933939687 1Burrow3451701330Adult2
20020625DOS24SY4079313916853 2Burrow320150570Adult3Ambrosia dumosa growing at mouth of burrow20020625DOS21UY
4086253918184 1Burrow3201601290Adult2 20020628DOS26SY4075543915653 1Pallet3201403104Adult320020628DOS26SY
4075373915602 2Burrow2801101020Adult320020628DOS26SY4075303915649 3Burrow290150620Adult220020709SNW22DN
4112683917917 1Burrow3301601150Adult320020715SNW27AY4095523915322 1Burrow11050370Imm.320020724CTL07BN
4103773911174 1Pallet260150320Adult3There are two cover sites on this date with a CoverID of 120020724FRJ10EY
4118453937631 1Pallet330140260Adult2There are two cover sites on this date with a CoverID of 120020724FRJ10EY
4118633937673 2Burrow310140990Adult1This burrow contained tortoise B3 20020724FRJ11EN4115063937330
3Burrow300130690Adult320020726FRJ10EN4119535937800 1Burrow470130 Adult1Tortoises B3 and B11 emerged from this burrow.
20020726FRJ10EN4119103938785 2Burrow360190140Adult120020726FRJ10EN4119873937668 3Burrow370150800Adult1
20020806FRJ07DY4111123939114 1Burrow280120580Adult320020806FRJ07DY4111503939169 2Burrow160907404Imm.4
20020830FRJ08HY4133223938512 1Burrow3301501160Adult31 coyote burrow < 8 meters away: 2nd, smaller burrow (kit fox?) 15
meters away; ~15 coyote scat within 15 meters of tortoise burrow; no tortoise remains in sca20020830FRJ08GN4127393938903
2Burrow320160660Adult3Also listed as predator concentration site 1 for this date20020830FRJ08GN4127223938896
3Burrow280140980Adult420020830FRJ08GN41227703938837 3Burrow340150800Adult1Tracks leading in and out of burrow (2
directions).20020830FRJ08GY4128363938793 5Burrow905032Juv.220020903DOS03CY3999563927355 1Burrow220110 Adult5
Poor condition: this is most likely an old kit fox or coyote burrow, but it could be tortoise20020910DOS25RN4070229936250
3Burrow2351201050Adult320020910DOS25SN4079573916175 1Pallet290140275Adult220020910DOS25SN4079383916324
2Burrow3101550404Adult3Some plant debris inside.20020911FRJ09GN4125213938288 1Burrow2701401560Adult2Human footprints
around burrow.20020911FRJ09GN4125443938295 2Pallet270130370Adult220020911FRJ09GN4125543938295
3Burrow2701501510Adult220020919FRJ11EY4118973937045 1Burrow2801007110Adult320020919FRJ11EY4118823937074
2Burrow3001601120Adult220020919FRJ11EY4118393937097 3Burrow300120550Adult320020919FRJ08HN4130093938667
4Burrow3501701200Adult120020919FRJ08GN4125743938425 3Burrow3101403504Adult1Rodent hole at back of burrow.
20020919FRJ08GN4125763938852 6Pallet3601503704Adult120020919FRJ08GN4125983938807 8Burrow3201508404Adult2
20021001FRJ11CY4106383937200 1Pallet270110180Adult420021001FRJ11CY4106523937212 8Burrow2501301010Adult4
Adult220021008FRJ05JY4141893940237 1Burrow330150830Adult220021008FRJ05JY4141203940262 2Burrow170110600Imm.3
20021015CIN04UN4085443912644 1Pallet200130230Adult320030806FRJ10EN4118623937673 1Burrow250180675Adult2Same
burrow as 20020724_CS2.20030806FRJ10EN4119903937670 2Burrow2201101065Adult3Same burrow as 20020726_CS3.
20030806FRJ10EN4119743937688 3Burrow210150740Adult220030806FRJ10EN4119353937794 5Burrow000Adult5Same burrow as
20020726_CS1. Burrow is filled in now (possible backfilling)20030806FRJ10EN4119313937945 8Burrow230140850Adult2
20030806FRJ10EN4119103937858 6Burrow240150100Adult2Same burrow as 20020726_CS2.20030827FRJ09IN4139963938035
1Burrow290140620Adult1Tortoise (B-13) inside burrow.20030827FRJ09JY4140303938942 8Burrow220130900Adult3

Table G: Tortoise Scat

Date is in the format YYYYMMDD. UTM's are in datum NAD87. Number refers to Quantity of Scat. Width and Length are in millimeters; if more than 1 piece of scat was found, the average width and length were recorded. Recency codes: 1=within this season, 2=within last year, 3=more than 1, probably more than 2 years old.

DateQuadratOn plot?UTMEastUTMNorthNumberWidthLengthRecencyNotes20020605CTL14AN4096173909799 3 1
20020618FRJ06IY4135803939792120682200206 18FRJ06IY4135633939721125503202062 18FRJ06HY4133983939724122453
20020618FRJ06HY1 20020715DOS27VY4093333391529 61 84712002072 4FRJ10EY4118633937673622542002072 4FRJ10EY
4118533937670310101202002724FRJ10EY4118543937668515261202072 4FRJ10EY4118543937664314321202072 4FRJ10EY
4118513937668315321202072 4FRJ10EY4118453937672512271202072 4FRJ10EN4118003937598115652202072 4FRJ10EY
4118183937670120421202072 4FRJ10EY4118193937672125341202072 4FRJ10EN4117263937544115322002072 4FRJ10EY
4118463937669120512202072 4FRJ10EY4118493937684416221202072 5FRJ10EN4116043937541220451202072 5FRJ10EN

411633393756512743120020725FRJ10EN411864393775121830120020725FRJ10EN411604393754112563320020725FRJ10EN
411633393756522044120020725FRJ10EN411637393757412538120020725FRJ10EN411639393756511737120020725FRJ10EN
411634393756211931120020725FRJ10EN411631393756811342320020725FRJ10EN411637393757413441220020725FRJ10EN
411661393759393183611 20020725 FRJ10E N 411671 3937605 2 15 37 1 20020725 FRJ10E N 411864 3937751 1 20 42 3 20020725 FRJ10E N 411864 3937743 2 18 38 1 20020726 FRJ10E N 411950 3937814 2 17 42 1 20020726 FRJ10E N 411970 3937657 1 25 60 1 20020726 FRJ10E N 411935 3937804 1 22 58 2 20020726 FRJ10E N 411953 3937805 1 18 32 3 20020726 FRJ10E N 411970 3937817 1 28 45 1 20020726 FRJ10E N 411933 3937844 2 17 41 3 20020726 FRJ10E N 411995 3937677 1 16 24 2 20020726 FRJ10E N 411794 3937537 1 17 50 1 20020830 FRJ08H Y 413372 3938528 1 20 26 2 20020830 FRJ08H N 413126 3938661 2 23 45 2 20020830 FRJ08G Y 412887 3938793 1 20 30 1 20020830 FRJ08G Y 412869 3938797 1 18 36 1 20020830 FRJ08G Y 412827 3938794 1 18 29 1 20020904 FRJ06J Y 414063 3939545 1 25 57 2 20020904 FRJ06K Y 414957 3939542 1 21 53 3 20020909 CTL03B N 410093 3913403 1 16 58 2 20020910 DOS25S N 407938 3916324 2 13 43 2 20020910 DOS25S N 407962 3916316 2 12 38 2 20020910 DOS25S N 407750 3916309 1 12 21 2 20020910 DOS25S N 407664 3916364 1 17 33 2 20020911 FRJ09G N 412609 3938195 1 24 55 1 20020911 FRJ09G N 412521 3938288 9 20 37 2 20020911 FRJ09G Y 412514 3938301 1 17 43 1 20020911 FRJ09G Y 412508 3938306 2 15 48 2 20020911 FRJ10F Y 412274 3937708 1 16 37 2 20020916 HRC13T N 408407 3936525 1 17 37 2 20020919 FRJ11E Y 411863 3937095 1 19 51 3 20020919 FRJ11E Y 411807 3937094 1 21 52 3 20020919 FRJ12F Y 412125 3936828 1 22 39 3 20020919 FRJ12F Y 412134 3936895 1 18 58 3 20020919 FRJ12F Y 412100 3936899 1 21 60 3 20020919 FRJ12F N 412090 3936884 1 20 62 3 20020919 FRJ12F Y 412103 3936871 2 10 25 2 20020919 FRJ12F N 412092 3936879 1 22 57 3 20020919 FRJ12F N 412074 3936939 2 20 62 3 20020919 FRJ12F N 412129 3936955 1 21 67 3 20020919 FRJ12F N 412119 3936940 1 14 61 3 20020919 FRJ12F N 412100 3936903 1 18 40 3 20020919 FRJ08G N 412766 3938803 1 19 41 1 20020919 FRJ08G N 412584 3938851 2 15 34 1 20020919 FRJ08G N 412956 3938644 1 14 48 3 20021001 FRJ10C N 410743 3937580 1 20 45 1 20021001 FRJ11C Y 410614 3937201 1 16 40 2 20021001 FRJ11C Y 410622 3937207 1 20 36 2 20021001 FRJ11C Y 410618 3937219 1 16 42 2 20021001 FRJ11C Y 410623 3937230 1 3 20021001 FRJ11C Y 410623 3937222 1 17 49 3 20021001 FRJ11C Y 410686 3937257 1 23 59 3 20021008 FRJ08J Y 414074 3938724 2 14 43 2 20021008 FRJ08J Y 414048 3938758 1 25 43 2 20021008 FRJ08J Y 414039 3938746 1 21 57 3 20021008 FRJ08J Y 414013 3938752 2 21 44 3 20021008 FRJ08J Y 414022 3938757 1 33 66 3 20021008 FRJ08J Y 414031 3938760 2 18 65 3 20021008 FRJ05J Y 414162 3940266 1 14 62 1 20021008 FRJ05J Y 414156 3940256 2 15 32 1 20021008 FRJ07J N 414461 3939191 1 15 31 2 20021015 CIN04U N 408529 3912646 1 18 34 1 20021015 CIN04U N 408610 3912612 1 16 42 1 20021015 CIN04U N 408601 3912629 1 16 31 2 20021015 CIN04U N 408599 3912637 2 19 39 2 20030806 FRJ10E N 411925 3937684 1 30 75 1 20030806 FRJ10E N 411937 3937694 1 18 39 1 20030806 FRJ10E N 411931 3937794 1 14 25 2 20030806 FRJ10E N 410355 3937925 1 16 68 2 20030827 FRJ09J N 413999 3938021 1 14 37 1 20030827 FRJ09J Y 414024 3938018 1 22 48 1 20030827 FRJ09J Y 414012 3938012 1 12 36 1 20030827 FRJ09J Y 414009 3938012 1 14 57 1 20030827 FRJ09J Y 414006 3938012 1 12 34 1 20030827 FRJ09J Y 414010 3938025 8 8 28 1 20030827 FRJ09J Y 414001 3938032 8 10 26 2 20030827 FRJ09J Y 414024 3938020 4 12 42 2 20030827 FRJ10J Y 414288 3937904 1 16 75 3 Many small pebbles in scat. 20030827 FRJ10J Y 414292 3937903 2 21 68 3 Many small pebbles in scat.

Table H: Other Tortoise Sign
Date Quadrat On plot? UTMEast UTMNorth Type Recency Notes 20020726 FRJ10E N 0 0 Footprints yesterday throughout area 20020909 CTL03B N 410205 3913427 Footprints less than 1 week 20020911 FRJ09G N 412602 3938202 Footprints 20020911 FRJ09G Y 412538 3938324 Footprints 20020911 FRJ09G Y 412572 3938347 Footprints 20021008 FRJ05J Y 414165 3940257 Footprints <1 week 20021008 FRJ07J N 414430 3939255 Footprints <1 week

Table I: Human Disturbance

Plot Name	Date	Vehicles 4WD Recent	Vehicles 4WD Old	Motorcycles	General Garbage	Balloons	Bullet Casings	Shooting Targets	Cattle Scat	Other Garbage
FRJ16H	20020611	0	0	0	1	1	0	0	184	
FRJ17I	20020611	0	0	0	6	1	0	0	165	
FRJ17J	20020611	0	0	0	1	0	0	0	278	
FRJ16J	20020611	0	0	2	0	0	0	0	242	
FRJ16I	20020611	0	0	0	2	0	2	0	147	
FRJ17H	20020611	0	0	0	7	1	0	0	127	
OWP09E	20020612	0	0	0	0	0	0	0	103	wooden survey marker
OWP09F	20020612	0	0	0	0	0	0	0	102	wooden survey marker
FRJ02H	20020612	0	0	0	2	0	0	0	54	
FRJ04I	20020613	1	0	0	1	1	1	0	184	
FRJ04H	20020613	0	0	0	0	0	0	0	152	
FRJ04G	20020613	1	0	0	0	0	0	0	143	
FRJ03H	20020614	0	0	0	0	0	0	0	83	
FRJ03G	20020614	0	0	0	0	0	0	0	72	
FRJ02G	20020614	0	0	0	0	0	0	0	235	
FRJ05G	20020618	0	0	0	1	0	0	0	125	
FRJ05H	20020618	0	0	0	3	0	0	0	312	Pile of garbage
FRJ05I	20020618	0	0	0	1	0	0	0	143	
FRJ06G	20020618	0	0	0	0	0	0	0	27	
FRJ06H	20020618	0	0	0	0	0	0	0	15	
FRJ06I	20020618	0	0	0	0	0	0	0	41	
HRC18B	20020620	1	0	0	4	0	0	0	141	
HRC18A	20020620	0	0	0	3	0	0	0	153	
CAC18V	20020620	1	0	0	1	0	1	0	147	
HRC19A	20020620	1	0	0	1	0	0	0	111	
HRC19B	20020620	1	0	0	3	2	1	0	151	
FRJ19H	20020621	0	0	0	1	0	0	0	69	
FRJ19G	20020621	1	0	0	4	0	2	0	82	
FRJ19F	20020621	0	0	1	0	0	0	0	68	
FRJ18F	20020621	0	0	0	1	0	0	0	114	
FRJ18G	20020621	0	0	0	0	0	0	0	164	
FRJ20F	20020624	0	0	0	1	0	1	0	126	
FRJ21F	20020624	0	0	1	2	2	0	0	107	
FRJ21E	20020624	0	0	2	0	0	0	0	89	
FRJ21D	20020624	0	0	1	0	0	0	0	117	
FRJ20D	20020624	0	0	0	2	0	0	0	75	
FRJ20E	20020624	0	0	2	4	0	0	0	139	
FRJ21I	20020624	0	0	0	1	0	0	0	39	
FRJ20H	20020624	0	0	0	0	1	0	0	42	
FRJ21H	20020624	0	0	0	0	1	0	0	52	
FRJ20G	20020624	1	0	0	16	0	5	0	32	
FRJ21G	20020624	1	0	10	1	0	0	0		
DOS21U	20020625	0	0	0	1	0	0	0	1	
DOS24S	20020625	0	0	1	0	3	0	0	0	
DOS26S	20020628	1	0	5	3	0	0	0	1	
SNW24A	20020628	0	0	0	14	0	0	2	10	
SNW25A	20020628	0	0	0	9	0	0	0	0	
DOS24V	20020628	0	0	0	1	0	0	0	0	

OWP05A	20020703	0	0	0	0	0	0	0	20		
OWP06A	20020703	0	0	0	1	0	0	0	4		
OWP06B	20020703	0	0	0	1	0	0	0	13		
SNW22E	20020709	1	0	0	5	1	0	1	0		
SNW21E	20020709	4	0	0	49	0	30	8	0		
SNW22D	20020709	0	0	0	4	1	4	0	0	2	pieces of lumber
HRC03V	20020711	0	0	0	0	0	2	0	258		
HRC03U	20020711	1	0	0	16	0	10	7	273		
HRC02U	20020711	0	0	0	0	0	1	0	390		
HRC02V	20020711	0	0	0	0	0	0	0	190		
HRC02T	20020711	0	0	0	1	0	7	0	218		
SNW27B	20020715	0	0	0	3	0	0	0	16		
SNW27A	20020715	0	0	0	1	0	1	0	1		
DOS27V	20020715	2	0	0	6	1	0	0	0		
SNW26A	20020715	0	0	0	0	0	1	1	3	3	pieces of lumber
SNW26B	20020715	1	0	10	16	0	3	0	8		
DOS12S	20020716	0	1	0	3	0	0	0	238		
DOS12T	20020716	2	0	4	7	1	0	0	265		
DOS12R	20020716	1	1	26	0	2	0	0	131		
DOS12Q	20020716	2	0	2	0	0	2	0	179		
DOS13S	20020716	1	0	3	3	1	5	0	191		
DOS13R	20020716	1	0	4	4	1	1	0	189		
HRC13I	20020717	0	0	0	0	0	1	0	130		
HRC13H	20020717	0	0	0	5	1	1	0	264		
HRC13J	20020717	0	0	0	0	1	0	0	171		
HRC13G	20020717	1	0	0	2	0	5	0	357		
HRC12G	20020717	1	0	0	0	0	2	0	73		
HRC14T	20020719	0	0	0	2	0	1	0	174		
HRC14U	20020719	0	0	1	0	1	0	0	200		
HRC15U	20020719	0	0	0	1	0	1	1	166		
HRC15T	20020719	0	0	0	5	3	0	0	108		
HRC15S	20020719	0	1	1	8	1	1	0	78	3	pieces of burnt lumber
HRC14S	20020719	0	0	0	2	0	0	0	242		
HRC26I	20020722	0	0	1	1	0	1	0	296		
HRC25I	20020722	0	0	1	4	0	2	1	324		
HRC26J	20020722	0	0	0	0	0	2	0	262	1	piece of lumber
DOS02N	20020723	1	0	0	0	0	0	0	126		
DOS01O	20020723	4	0	1	64	0	180	30	136	1	piece of lumber
DOS01N	20020723	1	0	1	0	0	0	0	23		
DOS02M	20020723	0	0	0	1	0	0	0	307		
DOS01M	20020723	1	0	1	1	1	0	0	558		
DOS02O	20020723	0	0	3	2	1	0	0	128		
CTL07B	20020724	0	0	0	61	0	5	3	3	2	pieces of lumber, 1 wrench, 1 shoe sole, 1 bolt
CTL07C	20020724	1	0	0	26	1	6	0	0	1	1941 nickel, 1 toy truck
CTL08B	20020724	0	0	5	7	0	3	0	0		
CTL09C	20020724	0	0	5	8	0	9	0	0	1	wooden marker
FRJ10E	20020724	0	0	2	2	0	3	0	117		
FRJ11D	20020725	1	0	2	27	1	7	3	154	1	lumber pile, 1 knife with case
FRJ10C	20020725	1	0	0	13	2	7	39	228		
FRJ09D	20020725	0	0	0	1	1	3	0	471		
FRJ09E	20020725	0	0	0	0	0	0	0	12		
FRJ10D	20020725	0	0	0	0	0	1	0	251		
HRC26L	20020729	1	0	5	43	0	12	149	299	2	propane tanks
HRC26M	20020729	0	0	0	4	0	1	0	138		
HRC27N	20020729	2	0	10	5	1	0	0	127	2	pieces of lumber
HRC26O	20020729	0	0	0	3	1	0	0	315		
HRC22M	20020730	1	0	0	4	2	1	0	165		
HRC22N	20020730	2	0	0	6	1	14	1	123		

HRC23O	20020730	3	0	0	6	0	1	0	424	
HRC22L	20020730	1	0	0	0	1	0	0	289	
HRC13S	20020731	0	0	0	2	0	0	0	248	2 pieces of lumber
HRC14R	20020731	0	0	3	0	0	0	0	67	
HRC13R	20020731	0	0	0	0	0	0	0	393	
HRC12Q	20020731	1	0	1	21	1	6	0	309	
HRC13Q	20020731	0	0	0	4	0	3	0	376	
DOS22O	20020802	0	0	0	3	0	5	0	7	
DOS23N	20020802	0	0	1	2	0	1	0	9	
DOS25N	20020802	0	0	0	3	0	1	0	0	1 wooden stake
DOS23O	20020802	1	0	1	1	0	1	0	0	
FRJ08C	20020806	0	0	0	1	0	0	0	295	
FRJ08D	20020806	0	0	0	0	0	0	0	352	
FRJ08E	20020806	0	0	0	0	0	0	0	129	
FRJ07D	20020806	0	0	0	0	0	0	0	34	
DOS05F	20020807	0	0	0	2	0	2	4	201	
DOS06H	20020807	0	0	2	0	0	0	0	109	1 wooden stake
DOS06I	20020807	0	0	1	0	1	0	0	87	
DOS05I	20020807	0	0	1	0	1	0	0	76	
DOS05H	20020807	0	0	0	0	0	1	0	90	
DOS14G	20020828	0	0	0	0	0	0	0	137	
DOS14F	20020828	2	0	0	38	2	43	33	233	4 pieces of lumber
DOS13F	20020828	0	0	0	0	1	0	0	468	
DOS13G	20020828	0	0	0	0	1	3	0	137	
DOS12G	20020828	0	0	0	2	0	0	0	161	
DOS13H	20020828	0	0	1	2	0	0	0	113	
FRJ08H	20020830	1	0	1	0	0	0	0	44	3 pieces of lumber
FRJ07H	20020830	0	0	0	0	0	0	0	124	
FRJ08G	20020830	0	0	2	0	0	0	0	146	
FRJ07G	20020830	0	0	2	0	0	0	0	32	1 piece of lumber
DOS04D	20020903	0	0	0	0	0	0	0	210	
DOS04E	20020903	1	0	0	1	0	0	0	229	
DOS02C	20020903	0	0	0	0	0	0	0	125	
DOS03C	20020903	0	0	0	1	1	0	0	193	
DOS03D	20020903	0	0	0	0	0	0	0	106	
FRJ06J	20020904	1	0	0	0	0	6	0	81	
FRJ06K	20020904	0	0	0	3	0	1	0	56	
FRJ06L	20020904	0	0	0	5	0	1	0	59	1 wooden stake
FRJ07K	20020904	5	0	0	14	0	10	0	56	2 tires, 1 piece of lumber, 1 motor casing(?)
FRJ07L	20020904	1	0	0	2	1	3	0	67	
CTL03B	20020909	0	0	0	26	0	14	1	0	broken glass in 5-meter radius (4 piles)
CTL04B	20020909	0	0	0	0	1	0	0	2	
DOS25R	20020910	0	0	1	1	0	0	0	0	
DOS27R	20020910	0	0	5	29	0	2	0	0	2 pieces of lumber
CTL10A	20020910	0	1	0	0	1	3	0	0	
FRJ08F	20020911	0	0	0	2	0	0	0	85	1 survey post
FRJ09F	20020911	0	0	0	1	0	0	0	81	
FRJ09G	20020911	0	0	1	0	1	0	0	67	
FRJ10F	20020911	0	0	0	0	0	0	0	112	
FRJ10G	20020911	0	0	0	0	0	0	0	98	
FRJ11F	20020911	0	0	0	1	0	0	0	144	
CIN03V	20020917	0	0	0	2	2	0	0	1	1 piece of lumber
CIN05V	20020917	2	0	2	1	0	0	0	0	1 tiny piece of plastic
CIN02U	20020917	0	0	0	3	0	2	0	1	
CTL03A	20020917	0	0	0	8	0	1	0	2	1 piece of wood with nails
CIN04V	20020917	0	0	0	3	1	2	0	3	
FRJ12E	20020919	0	0	0	1	0	0	0	44	
FRJ11E	20020919	1	0	2	12	1	2	0	127	
FRJ12F	20020919	1	0	0	7	1	1	0	99	1 wooden stake

FRJ11A	20021001	0	0	0	0	0	0	0	224		
HRC11V	20021001	0	0	0	0	0	0	0	431		
FRJ12A	20021001	0	0	0	0	0	0	0	338		
FRJ11B	20021001	0	0	0	0	1	3	0	0		
FRJ11C	20021001	0	0	0	2	0	4	0	0		
FRJ05K	20021008	0	0	0	1	0	1	0	62	2	pieces of lumber
FRJ05L	20021008	0	0	0	6	0	0	0	4	1	wooden stake
FRJ08J	20021008	5	0	12	12	1	7	2	113	1	wheelbarrow, 1 stake
FRJ05J	20021008	0	0	1	2	0	0	0	61		
CIN04S	20021015	0	0	2	0	1	0	0	0		
CIN05S	20021015	0	0	3	1	1	0	0	0		
CTL07A	20021015	0	0	0	5	1	3	0	2	1	piece of lumber, 1 log
HRC15P	20030709	0	1	0	11	0	10	0	452	1	pile of wood/lumber
HRC14P	20030709	0	0	0	0	1	0	0	21		
HRC15O	20030709	0	0	0	0	0	4	0	252		
HRC14O	20030709	0	0	0	8	0	0	0	45		
HRC14N	20030709	0	0	0	0	2	0	0	29		
HRC15N	20030709	0	0	0	0	0	1	0	44		
HRC18R	20030716	0	0	0	4	2	1	0	204	1	piece of wood
HRC17R	20030716	0	0	0	15	1	1	0	146		
HRC17S	20030716	0	0	0	10	0	0	0	209		
HRC16R	20030716	0	0	1	13	1	5	0	272		
HRC22E	20030718	0	1	1	2	0	0	0	293		
HRC21F	20030718	1	0	0	2	0	1	0	272		
HRC22F	20030718	0	0	2	0	0	2	0	178		
HRC21G	20030718	0	1	0	1	0	0	0	211		
HRC27L	20030728	0	0	1	4	0	1	0	201	1	log
HRC28L	20030728	0	0	0	0	0	1	0	148		
HRC28K	20030728	2	0	0	25	0	7	0	370	2	pieces of lumber/plywood
DOS01J	20030728	0	0	1	16	1	2	2	40	15	slugs
DOS01K	20030728	1	0	0	6	1	4	5	192		
FRJ12H	20030729	0	0	1	0	2	4	0	81		
FRJ12G	20030729	0	0	2	0	1	2	0	136		
FRJ12B	20030801	0	0	2	2	0	0	0	192		
FRJ12C	20030801	0	0	0	0	5	2	0	194		
FRJ12D	20030801	0	1	2	5	0	2	0	131	5	pieces of wooden stake
FRJ13C	20030801	0	0	2	4	0	3	0	200		
HRC18C	20030804	0	0	0	0	0	0	0	162		
HRC18D	20030804	0	1	0	1	2	1	0	150		
HRC18E	20030804	0	0	0	1	0	0	0	157		
HRC19E	20030804	0	0	1	0	0	1	0	234		
FRJ09C	20030806	0	0	0	4	0	3	11	397		
FRJ10B	20030806	1	0	2	4	0	1	0	153	1	pressed wood
HRC22G	20030808	0	0	0	0	0	0	0	294		
HRC22H	20030808	0	1	0	0	1	0	0	450	4	pieces of wood with nails
HRC221	20030808	0	0	0	1	0	1	0	582		
HRC231	20030808	0	0	0	0	0	0	0	543		
HRC20E	20030813	0	0	0	1	0	0	0	125		
HRC20D	20030813	0	0	0	2	0	1	1	208		
HRC21D	20030813	0	0	1	0	0	0	0	333	1	piece of metal
HRC21E	20030813	0	0	3	0	0	0	0	284	1	piece of wood, 1 motorcycle tire guard
HRC17P	20030814	0	0	0	0	0	1	0	22		
HRC17Q	20030814	0	1	0	3	2	1	0	154	1	piece of wood
HRC18P	20030814	0	0	0	0	0	0	0	77		
HRC18Q	20030814	0	0	0	0	0	0	0	92		
HRC15M	20030815	0	0	0	2	0	4	0	139	1	piece of barbed wire
HRC16M	20030815	0	0	0	0	0	0	0	130		
HRC15L	20030815	0	0	1	0	0	2	0	113		
HRC16L	20030815	0	0	0	0	1	0	0	166		

FRJ13F	20030825	0	0	1	0	0	1	0	128	
FRJ13E	20030825	0	0	2	1	1	0	0	167	
FRJ14C	20030825	0	0	0	0	0	0	0	197	
FRJ13D	20030825	0	0	0	0	0	0	0	253	1 clump of cotton
FRJ09K	20030827	0	0	1	2	1	0	0	67	
FRJ10J	20030827	0	0	2	0	0	2	0	104	
FRJ09J	20030827	0	0	1	0	0	1	0	131	
DOS10S	20030829	0	0	3	0	0	0	0	90	
DOS09R	20030829	0	0	2	0	0	2	0	184	
DOS08S	20030829	0	0	3	0	0	0	0	174	
DOS08R	20030829	0	0	4	0	0	0	0	147	
DOS09S	20030829	0	0	4	0	1	0	0	137	
DOS11R	20030902	0	0	2	1	0	1	0	117	
DOS10R	20030902	0	0	0	0	1	1	0	263	
DOS10Q	20030902	0	0	1	1	0	2	0	187	
DOS11Q	20030902	1	0	1	4	0	3	0	215	
DOS10N	20030903	2	0	2	2	0	3	0	251	
DOS10L	20030903	1	0	0	12	0	80	25	102	
DOS10M	20030903	1	1	3	6	0	2	0	238	1 lead pipe, 2 cigarette butts
DOS09M	20030903	2	0	4	7	0	5	0	176	
DOS10O	20030904	1	0	1	1	0	8	0	170	
DOS11O	20030904	0	0	3	0	0	3	0	353	
DOS11P	20030904	1	0	1	0	1	3	0	125	
DOS10P	20030904	1	0	2	1	1	2	0	135	
DOS09N	20030909	0	0	1	1	0	0	0	155	
DOS09O	20030909	1	0	1	0	0	0	0	196	
DOS08O	20030909	0	0	0	1	0	0	0	168	
DOS08N	20030909	0	0	0	0	2	4	0	253	
DOS08M	20030909	0	0	0	1	0	1	0	172	
DOS07I	20030910	0	0	0	2	0	1	0	317	
DOS07H	20030910	0	0	1	0	0	3	0	115	
DOS06J	20030910	0	0	0	1	1	0	0	109	
DOS07J	20030910	0	0	1	0	0	0	0	171	
DOS11S	20030911	2	0	0	2	0	2	0	214	
DOS10T	20030911	2	0	1	12	2	5	0	182	1 nail
DOS11T	20030911	0	0	1	0	0	2	0	229	
DOS08J	20030911	0	0	0	0	0	2	0	100	
DOS09Q	20030912	1	0	1	4	0	3	0	237	
DOS08Q	20030912	1	0	1	0	0	1	0	302	
DOS07Q	20030912	0	0	1	1	0	0	0	651	
DOS07R	20030912	0	0	1	0	2	0	0	450	
DOS04P	20030915	0	0	2	0	1	4	0	201	
DOS05Q	20030915	0	0	2	0	0	0	0	222	
DOS05P	20030915	0	0	3	1	0	0	0	341	
DOS05O	20030915	0	0	2	0	0	1	0	296	1 piece of tire
FRJ11G	20030916	0	0	1	2	1	0	0	48	
FRJ11H	20030916	0	0	1	2	0	0	0	261	
FRJ10H	20030916	1	0	1	3	3	0	0	135	
FRJ09H	20030916	2	0	0	2	0	1	0	143	
FRJ14B	20030918	0	0	1	1	0	1	0	295	
FRJ13B	20030918	0	0	1	0	0	0	0	222	
FRJ14A	20030918	0	0	0	2	0	0	0	229	
HRC14V	20030918	0	0	0	1	0	1	0	195	

Table J: Daily Summary

Date	Region	Recorder	Plots Searched
20020605	Red Rock	Kevin Keith	CTL12B, CTL12A, CIN12V
20020611	Indian Wells	Heath McAllister	FRJ16H, FRJ16I, FRJ16J, FRJ17H, FRJ17I, FRJ17J
20020612	Kiavah Apron	Shan Asselta	OWP09E, OWP09F, FRJ02H

20020613	Kiavah Apron	Morgan Ruelle	FRJ04I, FRJ04H, FRJ04G
20020614	Kiavah Apron	Morgan Ruelle	FRJ03H, FRJ03G, FRJ02G
20020618	Kiavah Apron	Shan Asselta	FRJ05I, FRJ05G, FRJ05H, FRJ06G, FRJ06H, FRJ06I
20020620	Blackhrush	Kevin Keith	HRC18B, HRC18A, CAC18V, HRC19A, HRC19B
20020621	Indian Wells	Morgan Ruelle	FRJ19H, FRJ19G, FRJ19F, FRJ18F, FRJ18G
20020624	Indian Wells	K. Keith, S.Asselta	FRJ20G, FRJ20H, FRJ21H, FRJ21I, FRJ21G, FRJ20F, FRJ20E, FRJ20D, FRJ21D, FRJ21E, FRJ21F
20020625	Red Rock	Heath McAllister	DOS21U, DOS24S
20020628	Red Rock	Kevin Keith	SNW24A, SNW25A, DOS24V
20020703	Kiavah Apron	Heath McAllister	OWP05A, OWP06A, OWP06B
20020709	Red Rock	Kevin Keith	SNW21E, SNW22E, SNW22D
20020711	Kiavah Apron	Heath McAllister	HRC02T, HRC03U, HRC02U, HRC02V, HRC03V
20020715	Red Rock	Morgan Ruelle	SNW27B, SNW27A, DOS27V, SNW26A, SNW26B
20020716	Blackbrush	Kevin Keith	DOS12Q, DOS12R, DOS12S, DOS12T, DOS13S, DOS13R
20020717	Blackbrush	Morgan Ruelle	HRC13I, HRC13H, HRC13J, HRC13G, HRC12G
20020719	Kiavah Apron	Kevin Keith	HRC14S, HRC15S, HRC15T, HRC15U, HRC14U, HRC14T
20020722	Blackbrush	James Weigand	HRC26J, HRC25I, HRC26I
20020723	Blackbrush	Morgan Ruelle	DOS01M, DOS01N, DOS01O, DOS02M, DOS02N, DOS02O
20020724	Red Rock, Kiavah Apron	J.Weigand, H.McAllister	CTL07C, CTL07B, CTL08B, CTL09C, FRJ10E
20020725	Kiavah Apron	Morgan Ruelle	FRJ09D, FRJ09E, FRJ10C, FRJ10D, FRJ11D
20020726	Kiavah Apron	Kevin Keith	none
20020729	Blackbrush	James Weigand	HRC27N, HRC26L, HRC26M, HRC26O
20020730	Blackbrush	James Weigand	HRC23O, HRC22L, HRC22M, HRC22N
20020731	Kiavah Apron	Morgan Ruelle	HRC13S, HRC14R, HRC13R, HRC12Q, HRC13Q
20020802	South Dove Springs	James Weigand	DOS22O, DOS23N, DOS25N, DOS23O
20020806	Kiavah Apron	Morgan Ruelle	FRJ07D, FRJ08C, FRJ08D, FRJ08E
20020807	Blackbrush	Kevin Keith	DOS05F, DOS05H, DOS05I, DOS06H, DOS06I
20020828	Blackbrush	Morgan Ruelle	DOS14G, DOS13H, DOS12G, DOS13G, DOS13F, DOS14F
20020830	Kiavah Apron	Kevin Keith	FRJ08H, FRJ07H, FRJ07G, FRJ08G
20020903	Blackbrush	Morgan Ruelle	DOS02C, DOS03C, DOS03D, DOS04D, DOS04E
20020904	Kiavah Apron	Kevin Keith	FRJ06J, FRJ06K, FRJ06L, FRJ07K, FRJ07L
20020909	Red Rock	Kevin Keith	CTL03B, CTL04B
20020910	Red Rock	Morgan Ruelle	DOS25R, DOS27R, CTL10A
20020911	Kiavah Apron	Kevin Keith	FRJ08F, FRJ09F, FRJ09G, FRJ10F, FRJ10G, FRJ11F
20020916	Kiavah Apron	Morgan Ruelle	Searched ~200 m from plots (datum was set to NAD27): HRC12U, HRC12V, HRC13T, HRC13U, HRC13V, FRJ13A
20020917	Red Rock	Kevin Keith	CIN02U, CIN03V, CTL03A, CIN04V, CIN05V
20020919	Kiavah Apron	Kevin Keith	FRJ11E, FRJ12E, FRJ12F
20021001	Kiavah Apron	Morgan Ruelle	HRC11V, FRJ11A, FRJ11B, FRJ11C, FRJ12A
20021008	Kiavah Apron.	Kevin Keith	FRJ05L, FRJ05K, FRJ05J, FRJ08J
20021015	Red Rock	Kevin Keith	CIN04S, CIN05S, CTL07A
20030709	Blackbrush	Kevin Keith	HRC15N, HRC14N, HRC14O, HRC14P, HRC15P
20030716	Blackbrush	Jane Buck	HRC17R, HRC17S, HRC16R, HRC18R
20030718	Blackbrush	Jane Buck	HRC21F, HRC22F, HRC22E, HRC21G
20030728	Blackbrush	Jane Buck	HRC28L, HRC28K, HRC27L, DOS01J, DOS01K
20030729	Kiavah Apron	Kevin Keith	FRJ12H, FRJ12G
20030801	Kiavah Apron	Jason Breiter	FRJ12B, FRJ12C, FRJ12D, FRJ13C
20030804	Blackbrush	Jason Breiter	HRC18C, HRC18D, HRC18E, HRC19E
20030806	Kiavah Apron	Jane Buck	FRJ10B, FRJ96
20030808	Blackbrush	Kevin Keith	HRC22G, HRC22H, HRC22I, HRC23I
20030813	Blackbrush	Kevin Keith	HRC20E, HRC20D, HRC21E, HRC21D
20030814	Blackbrush	Jason Breiter	HRC17P, HRC17Q, HRC18P, HRC18Q
20030815	Blackbrush	Jane Buck	HRC16M, HRC15L, HRC15M, HRC16L
20030825	Kiavah Apron	Kevin Keith	FRJ13F, FRJ13E, FRJ13D, FRJ14C
20030827	Kiavah Apron	Kevin Keith	FRJ09K, FRJ10J, FRJ09J
20030829	Blackbrush	Jane Buck	DOS10S, DOS09S, DOS09R, DOS08R, DOS08S
20030902	Blackbrush	Kevin Keith	DOS11R, DOS10R, DOS10Q, DOS11Q
20030903	Blackbrush	Jason Breiter	DOS09M, DOS10L, DOS10M, DOS10N
20030904	Blackbrush	Kevin Keith	DOS11O, DOS11P, DOS10P, DOS 10O

20030909Blackbrush	Jane Buck	DOS09O, DOS08O, DOS09N, DOS08N, DOS08M
20030910Blackbrush	Kevin Keith	DOS07J, DOS06J, DOS07H, DOS07I
20030911Blackbrush	Jason Breiter	DOS08J, DOS10T, DOS11S, DOS11T
20030912Blackbrush	Kevin Keith	DOS09Q, DOS08Q, DOS07Q, DOS07R
20030915Blackbrush	Kevin Keith	DOS04P, DOS05Q, DOS05P, DOS05O
20030916Kiavah Apron	Kevin Keith	FRJ11G, FRJ11H, FRJ10H, FRJ09H
20030918Kiavah Apron	Jason Breiter	FRJ14B, FRJ14A, FRJ13B, HRC14V

Table K: Daily Search Effort

Dates are in the form YYYYMMDD. Start Times and End Times are Pacific Standard Time. Search, Process, and Total Field Minutes are Person-Minutes (i.e. if two researchers each spent 120 minutes searching plots during a day the Search Time would be 240 minutes). Live Tortoises, Remains, and Cover Sites are totals for the day.

Date	Start Time	End Time	Search (Minutes)	Process (Minutes)	Total Field Minutes	Live Tortoises	Remains	Cover Sites	Notes
20020605	723	1105	201	90	666	0	1	2	
20020611	515	1120	546	52	1452	0	0	2	
20020612	513	1045	369	56	996	0	0	1	
20020613	500	850	218	0	460	0	0	0	
20020614	455	944	209	0	578	0	0	0	
20020618	552	1135	696	192	1372	0	0	3	
20020620	525	1159	402	0	780	0	0	0	
20020621	525	857	297	0	636	0	0	0	
20020624	550	1131	744	0	1366	0	0	0	
20020625	649	1142	144	98	594	0	0	2	
20020628	518	1134	318	58	668	0	0	3	
20020703	514	950	288	0	552	0	0	0	
20020709	513	931	197	110	516	0	1	1	
20020711	530	1018	378	0	576	0	0	0	
20020715	515	1100	414	68	690	0	1	1	
20020716	518	948	372	0	810	0	0	0	
20020717	555	1017	331	0	783	0	0	0	
20020719	531	1032	327	0	600	0	0	0	
20020722	832	1055	218	0	429	0	0	0	
20020723	524	1051	339	0	654	0	0	0	
20020724	530	1140	358	466	1164	1	3	4	
20020725	452	1151	346	116	838	1	0	0	Very smokey; revisited tortoise B3, and cover sites 2 and 3 from 20020724 for photographs.
20020726	508	1019	0	442	618	2	0	3	Very smokey.
20020729	519	1026	371	0	580	0	0	0	Very smokey and windy.
20020730	528	1029	344	0	602	0	0	0	Smokey.
20020731	519	1057	303	22	676	0	0	0	Smokey.
20020802	544	1118	343	28	668	0	0	0	
20020806	503	935	295	36	544	0	0	2	
20020807	525	930	284	0	480	0	0	0	
20020828	634	1212	424	0	676	0	0	0	
20020830	533	1134	276	124	722	0	0	5	
20020903	750	1229	306	26	558	0	0	1	
20020904	530	1000	332	0	540	0	0	0	
20020909	543	1126	176	8	686	0	0	0	
20020910	550	1158	207	64	736	0	0	3	
20020911	537	1238	377	144	842	0	0	3	
20020916	528	1132	0	4	728	0	0	0	
20020917	615	1146	306	0	660	0	0	0	
20020919	555	1226	185	166	680	0	0	7	
20021001	621	1122	299	68	602	0	0	2	

20021008	709	1302	250	116	720	0	0	3	
20021015	652	1240	167	198	696	0	2	1	
20030709	520	1121	356	0	720	0	0	0	
20030716	545	937	220	0	464	0	0	0	
20030718	525	1030	291	20	610	0	0	0	
20030728	515	1010	360	0	590	0	0	0	
20030729	523	917	157	0	240	0	0	0	
20030801	458	1001	300	0	606	0	0	0	
20030804	527	1025	320	0	596	0	0	0	
20030806	510	1020	155	140	620	0	0	6	All cover sites were previously discovered in 2002, except for two.
20030808	655	1051	248	0	472	0	0	0	
20030813	620	1027	254	0	494	0	0	0	
20030814	612	1030	296	0	516	0	0	0	
20030815	625	1025	275	0	480	0	0	0	
20030825	615	1019	221	0	480	0	0	0	
20030827	552	1121	192	290	660	1	0	2	
20030829	615	1045	310	0	540	0	0	0	
20030902	620	1007	238	0	454	0	0	0	
20030903	622	1030	276	0	496	0	0	0	
20030904	611	927	225	0	392	0	0	0	
20030909	620	1040	285	0	520	0	0	0	
20030910	638	1019	230	0	442	0	0	0	
20030911	621	1010	243	0	458	0	0	0	
20030912	645	1027	228	0	444	0	0	0	
20030915	710	1127	243	0	514	0	0	0	
20030916	715	1032	224	0	394	0	0	0	
20030918	715	1030	205	0	390	0	0	0	